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FINAL

UNDERGROUND STORAGE TANK INVESTIGATION REPORT UMATILLA DEPOT ACTIVITY HERMISTON, OREGON

Contract No. DAAA15-90-D-0015
Delivery Order No. 10

Prepared for:

U.S. ARMY ENVIRONMENTAL CENTER
Aberdeen Proving Ground, Maryland 21010

Prepared by:

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The Underground Storage Tank (UST) Investigation Report has been prepared for the U.S. Army Environmental Center (USAEC) to present the results of the UST field investigation at Umatilla Depot Activity (UMDA), Hermiston, Oregon. It has been prepared for USAEC under the Base Realignment and Closure (BRAC) Program. Although the UST investigation was performed in conjunction with the Remedial Investigation/Feasibility Study (RI/FS) activities at UMDA, it was not part of the RI/FS.

The purpose of the UST investigation report is to document the results of the UST field investigation, which included sampling and chemical analysis of the unknown contents of five tanks, tank leak testing of 30 active tanks, geophysical surveys at 14 potential UST sites, soil gas surveys at 17 potential UST and fuel oil spill sites, and soil sampling and analysis. The information gathered is used to assess the potential for contamination and to present recommendations for further action.

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LIST OF ACRONYMS AND ABBREVIATIONS

AST	Aboveground storage tank
BNAs	Base-neutral and acid extractable organics
BRAC	Base Realignment and Closure
BTEX	Benzene, toluene, ethylbenzene, and xylenes
COD	Criteria of detection
CRL	Certified Reporting Limit
DOD	U.S. Department of Defense
EM	Electromagnetic
EPA	U.S. Environmental Protection Agency
ESE	Environmental Science & Engineering, Inc.
FID	Flame ionization detector
FSP	Field Sampling Plan
GC	Gas chromatography
gph	Gallons per hour
HSP	Health and Safety Plan
IRDMIS	Installation Restoration Data Management Information System
MDL	Method detection limit
MS	Mass spectrometry
$\mu g/g$	Micrograms per gram
$\mu g/L$	Micrograms per liter
NFPA	National Fire Protection Association
ORUM	Other regulated underground material
PCB	Polychlorinated biphenyl
PA	Preliminary Assessment
PCE	Tetrachloroethene
PID	Photoionization detector
ppm	Parts per million
QA	Quality assurance

LIST OF ACRONYMS AND ABBREVIATIONS (cont'd)

QAPP	Quality Assurance Project Plan
QC	Quality control
RI/FS	Remedial Investigation/Feasibility Study
SOP	Standard operating procedure
TAL	Target Analyte List
TCD	Thermal conductivity detector
TCE	Trichloroethene
TCL	Target Compound List
TIC	Tentatively identified compound
TPHC	Total petroleum hydrocarbon
TVHC	Total volatile hydrocarbon
UMDA	Umatilla Depot Activity
USAEC	U.S. Army Environmental Center, formerly USATHAMA
USACE	U.S. Army Corps of Engineers
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USGS	U.S. Geological Survey
UST	Underground storage tank
VOA	Volatile organic analyte
VOC	Volatile organic compound

1.0 INTRODUCTION

This document is the Underground Storage Tank (UST) Investigation Report for Umatilla Depot Activity (UMDA), Hermiston, Oregon. It is prepared under Contract No. DAAA15-90-D-0015, Delivery Order No. 10, for the U.S. Army Environmental Center (USAEC), formerly the U.S. Army Toxic and Hazardous Materials Agency (USATHAMA), in support of the U.S. Department of Defense (DOD) Base Realignment and Closure (BRAC) Program at UMDA. The UST investigation is being performed in conjunction with, though not as part of, the UMDA Remedial Investigation/Feasibility Study (RI/FS).

The objective of the UST investigation is to evaluate whether any USTs have leaked or are presently leaking product and what effect that leakage might have on the surrounding soil and groundwater. In addition, the U.S. Army requires all Army-owned USTs to be treated as regulated tanks regardless of state requirements. Therefore, the objectives of the UST/subsurface structure survey at UMDA are to:

- Identify, locate, and characterize (i.e., describe and qualitatively evaluate) subsurface structures that may be a source of, or provide a conduit for, contamination. These structures may include USTs, sumps, septic tanks, sewer lines, etc.
- Perform additional investigations at USTs, including leak testing to determine tank integrity (where possible), and soil gas/soil sampling and monitoring well installation in areas where leaks may have occurred.
- Evaluate data to assess the potential for contamination from leaking tanks.

The purpose of this report is to present the results of the field investigation, assess the potential for contamination, and present recommendations for further action. Field and laboratory activities detailed in this report were conducted in two phases. The first phase included leak testing of 30 tanks, geophysical surveying at 14

potential UST sites, and soil gas sampling and analysis at 17 former or potential UST sites. Based on an evaluation of data from these activities, the second phase included soil sampling and analysis at sites where leak test results were inconclusive or indicated a leaking tank, or where soil gas sampling results indicated significant soil contamination. The information in this report is current as of April 1994.

The UST investigation was based on a review of available information from UMDA records and retirees and a site reconnaissance performed in February 1992. Methods and procedures followed during field sampling, chemical analyses, data management, and data evaluation are presented in the UST Field Sampling Plan (FSP; Dames & Moore, 1992a). Standard operating procedures (SOPs) for field data-gathering methods, and protocols for sample handling and analysis, are presented in the SOPs for the Survey of Underground Storage Tanks (Dames & Moore, 1990e) and in the FSP for the RI/FS (Dames & Moore, 1990b). Fieldwork and chemical analyses were performed in accordance with the Quality Assurance Project Plan (QAPP), Part C (Dames & Moore, 1990c), and the Health and Safety Plan (HSP), Part D (Dames & Moore, 1990d). An addendum to the HSP--which provided additional information relevant to the UST investigation--is presented in Appendix A of the UST FSP (Dames & Moore, 1992a). Data management, evaluation, and reporting were performed according to the SOPs (Dames & Moore, 1990e).

The organization of the remainder of the UST Investigation Report is as follows:

- Section 2.0 presents an overview of the UST investigation program. Tanks not included in the study are briefly discussed. Methodologies for sampling of tank contents, geophysical surveys, soil gas surveys, and soil sampling are presented. Surveying, field quality control (QC) samples, the chemical analysis program, and the approach to analysis of results are also included in this section.

- Section 3.0 discusses results of the UST investigation for each tank, including tank description, specific investigations, contamination assessment, and conclusions and recommendations.
- Section 4.0 summarizes the UST investigation conclusions and recommendations. Included is a tabular summary of site-specific investigations and recommendations.

In addition, the following information is provided in the appendices to the UST Investigation Report:

- Appendix A: Underground Storage Tank Information
- Appendix B: Tank Leak Testing Certificates and Results
- Appendix C: Geophysical Survey Results
- Appendix D: Tracer Research Corporation, Active Soil Gas Survey Report
- Appendix E: Northeast Research Institute, Inc., Passive Soil Gas Survey Report
- Appendix F: Summary of IRDMIS Data Validation
- Appendix G: Evaluation of Laboratory and Field QC Sample Results
- Appendix H: IRDMIS Flagging Codes

2.0 UST INVESTIGATION PROGRAM SUMMARY

2.1 OVERVIEW

In 1989, the U.S. Army Corps of Engineers (USACE) investigated the USTs at UMDA (USACE, 1989). The primary objective of this investigation was to identify USTs in need of remedial action and to evaluate and qualify each tank as eligible or ineligible for Defense Environmental Restoration Account funding. During the investigation, USTs were assigned numerical Other Regulated Underground Material (ORUM) designations. A total of 83 USTs were inventoried in the USACE investigation. The inventory included a site visit to each UST, compilation of tank data (e.g., tank status, date of installation, tank material, contents, size, sketch of location, evidence of past and current leaks or spills, and contamination of environmental media), and collection of installation soil data.

Of the 83 inventoried tanks, 19 were identified as septic tanks and were investigated during the UMDA RI/FS. Two other tanks--a water tank (ORUM 073) and a manhole for a water line (ORUM 079)--were not target USTs for this investigation. Therefore, 62 tanks were to be included in the UST investigation. The USACE investigation did not involve leak testing, but did identify 14 USTs as regulated tanks, which require such analyses. The USACE investigation also did not include analysis of tank contents, soil sampling, or geophysical investigations to identify additional USTs.

In January 1990, Dames & Moore conducted an Enhanced Preliminary Assessment (PA) at UMDA to identify any additional USTs and to confirm UST locations (Dames & Moore, 1990a). Through a review of records and interviews with present and former UMDA employees, Dames & Moore identified 33 additional USTs, bringing the total number to be included in the UST investigation to 95. For these USTs, the Enhanced PA identified or confirmed such information as tank number, location, tank status, approximate year of installation, estimated volume, tank

contents, and construction material. The information obtained during the Enhanced PA is also presented in the UST SOPs (Dames & Moore, 1990e).

In February 1992, Dames & Moore conducted a field reconnaissance to positively locate and map the USTs identified in the USACE and Enhanced PA studies, to identify any other USTs, and to gather information for preparing and implementing an FSP for the UST investigation. As a result of the field reconnaissance and records review, six additional tanks and one underground pipe structure (counted as an UST for the purposes of this study) were identified for inclusion in the UST investigation. A detailed list of information on the 102 USTs observed during the field reconnaissance is presented in Appendix A. Locations of USTs are shown on Plates 1 and 2, which are in map folders at the end of this report. Other than septic tanks, which were investigated as part of the UMDA RI/FS, ORUM and UST numbers are the same up to and including ORUM/UST 50. From that point, the UST and ORUM numbers are not the same--to allow for the tanks included in this UST investigation to be consecutively numbered.

2.2 TANKS NOT INCLUDED IN UST INVESTIGATION

Originally, it was planned that only 91 of the 102 USTs and structures would be investigated as part of this study. The following 11 tanks were not included in the UST investigation:

- USTs 41, 44, 45, and 46--These four tanks--which are undergoing State-regulated closure--were recently removed and disposed of off post by a certified tank removal contractor under the direction of UMDA services personnel.

- UST 54 (ORUM 56)--This tank was used to contain wastewater from chemical agent decontamination operations at Building 656 in the K-block area of UMDA. According to UMDA personnel, this wastewater was periodically tested for the presence of chemical agents

and disposed of by a waste disposal contractor. UST 54 was recently removed and is to be replaced by a new underground holding tank.

At the time of the UST investigation, a 30-gallon drum nested within a 55-gallon drum was used to contain the wastewater. This temporary system was situated below grade in the excavation where the former tank had been located. No work was conducted at this location, because UST 54 had been removed, and--according to UMDA personnel present at the time of tank removal--there were no signs of pipeline or tank leakage.

- UST 63--This is a clear polyethylene tank for holding neutralized battery electrolyte. The tank is located within an accessible concrete vault. At the time of the field reconnaissance, the tank appeared to be in good condition, though the tank bottom and seams could not be assessed. Because the corrosives in the tank are neutralized and the contents are periodically tested by UMDA personnel, UST 63 was not investigated as part of this study.

- UST 78--Discussions with UMDA personnel indicated that UST 78 was an aboveground tank used to store oil for road application. This tank was reportedly removed approximately 10 years ago. The UST SOP report lists UST 78 as a boiler blowdown tank for Building 28 (Dames & Moore, 1990e). Visual inspection of the site during the field reconnaissance did not indicate the presence of an UST (i.e., no vent, fill cap, or evidence of excavation/remediation). Additionally, the boiler blowdown tank for Building 28 was identified as the cylindrical aboveground tank presently in use. Therefore, the UST 78 site was not further investigated.

- UST 85--Discussions with UMDA employees indicated that UST 85--listed in the UST SOP report as a boiler blowdown tank--most likely is

the steam condensation tank in Building 31 (Dames & Moore, 1990e). (UMDA personnel indicated that a boiler blowdown tank would not be needed for this steam system.) No boiler blowdown tank was observed at the mapped location for UST 85 during the February 1992 field reconnaissance at UMDA. UST 85 was reported to be in line with steam pipes that are used to warm heating oil in USTs 21 to 23. Because contaminants are not expected to be associated with this steam system, UST 85 was not investigated as part of this study.

- USTs 83 and 95--These tanks, as listed in the UST SOP report (Dames & Moore, 1990e), were determined to be the same as UST 05 (ORUM 05) and UST 58 (ORUM 78), respectively, which were identified by USACE and are included in this investigation.
- UST 94--Because UST 94 was sampled as part of RI study Site 53, Building 433 Collection Sump/Cistern and Disposal Area (Dames & Moore, 1992b), it was not resampled in this study.

In addition to the 11 tanks described above, 22 inactive USTs (originally planned to be leak tested as part of this investigation) were excluded from this study. During the field program, UMDA personnel--in consultation with USAEC--had determined that these tanks would be removed under a separate UMDA contract in accordance with State tank closure procedures.

Two active tanks--USTs 42 and 43--were removed from the site investigation, because each UST has a leak detection system. A third active tank, UST 58, was excluded from the investigation, because UMDA personnel were unable to schedule sampling and chemical agents screening of the tank contents prior to completion of the tank leak testing program. According to UMDA personnel, this tank will be investigated under a separate contract.

In summary, 66 USTs are included in the current investigation. Table 2-1 lists those USTs that were excluded from the study.

TABLE 2-1
USTs Deleted from UST Investigation

UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or Inactive)	Surface Features (d)
UST 5	ORUM 5	1 / Adm.	18	DF 2	1,000	INA	P
UST 7	ORUM 7	1 / Adm.	32	DF 2	1,000	INA	P
UST 34	ORUM 34	1 / Adm.	34	DF 2	1,000	INA	P
UST 35	ORUM 35	2 / II	105	DF 2	1,000	INA	P
UST 36	ORUM 36	2 / II	106	DF 2	10,310	INA	P
UST 37	ORUM 37	2 / II	115	HT 5	10,310	INA	P
UST 38	ORUM 38	2 / II	117	HT 5	10,310	INA	P
UST 39	ORUM 39	2 / V	486	HT 5	25,049	INA	P
UST 40	ORUM 40	2 / II	130	DF 2	1,000	INA	P
UST 41	ORUM 41	2 / VII	Airport	Gasoline	10,310	INA	RMD
UST 42	ORUM 42	1 / Adm.	Fuel Yd.	Gasoline	50,750	A	P
UST 43	ORUM 43	1 / Adm.	Fuel Yd.	DF 2	50,750	A	P
UST 44	ORUM 44	1 / Adm.	5	Waste oil	500	INA	RMD
UST 45	ORUM 45	1 / Adm.	9/10	Waste oil	500	INA	RMD
UST 46	ORUM 46	1 / Adm.	24	Gasoline	140	INA	RMD
UST 47	ORUM 47	2 / II	9/160	Gasoline	110	A	P
UST 48	ORUM 48	2 / II	135	Gasoline	110	A	P
UST 49	ORUM 49	2 / II	133	Gasoline	110	A	P
UST 50	ORUM 50	2 / II	133	Gasoline	110	A	P
UST 51	ORUM 53	1 / Adm.	51	DF 2	1,000	A	P
UST 52	ORUM 54	2 / II	104	DF 2	1,000	INA	P
UST 53	ORUM 55	2 / V	448/Wildlife Station	DF 2	1,000	INA	P
UST 54	ORUM 56	2 / IV	656	Chemical Decon.	Unknown	A	RPD
UST 55	ORUM 74	2 / III	617	Gasoline or DF2	Unknown	INA	NP
UST 56	ORUM 75	2 / III	457	Gasoline or DF2	Unknown	INA	P
UST 57	ORUM 77	2 / V	419	DF 2	Unknown	INA	P
UST 58	ORUM 78	2/IV	654	Chemical Decon.	Unknown	A	P
UST 63	ORUM n/a	1 / Adm.	27	Battery Acid	500	A	P
UST 78	ORUM n/a	1 / Adm.	28	Boiler blowdown	500	INA	NP
UST 83	ORUM 5	1 / Adm.	18	DF 2	1,000	INA	P
UST 85	ORUM n/a	1 / Adm.	31	Condensation Tank	Unknown	INA	NP
UST 87	ORUM n/a	2 / II	52/206	DF 2	1,000	INA	P
UST 92	ORUM n/a	2 / V	486	Likely DF2	Unknown	INA	P
UST 94	ORUM n/a	2 / VII	433	Boiler blowdown	500	INA	P
UST 95	ORUM 78	2 / IV	654	Chemical Decon.	Unknown	A	P
UST 96	ORUM n/a	2 / VII	Airport	Water	Unknown	INA	P

* - See text for explanations of why USTs were deleted from UST investigation.
a - Tank designation from U.S. Army Corps of Engineers 1989, UMDA underground storage tank investigation.
b - See enclosed Plates 1 and 2.
c - DF2 = diesel fuel No. 2; HT5 = Heating oil No. 5.
d - P = present; NP = not present.

2.3 SAMPLING OF TANK CONTENTS

Seven inactive tanks with unknown contents were planned to be sampled to determine the composition of any product remaining in the vessels; to provide an indication of the parameters to be analyzed in subsequent soil gas or soil sampling, if required; and to assist in determining the means of disposing of the contents. Acidic or corrosive liquids must be removed prior to leak testing.

Samples of contents from five of the seven tanks were collected and chemically analyzed for potential organic and inorganic constituents of concern. Liquid samples were collected from USTs 93, 96, 98, and 101. A sludge sample was collected from UST 92. Results of the contents sampling program are presented in Section 3.0 with the UST-specific discussions.

Samples from the other two inactive tanks--UST 58 and UST 97--were not collected during this investigation. Because UST 58 may contain chemical agent wastes, U.S. Army personnel were required to collect a sample and screen the contents for the presence of chemical agents GB, VX, and H prior to laboratory analysis and scheduled leak testing. However, the collection of a contents sample was not possible because of scheduling difficulties at UMDA. UST 97, a small 30-gallon tank partially buried in the ground near Building 433, was empty and was not sampled.

These are the only USTs that required contents sampling, because products stored in the other tanks were known and did not require chemical identification, or the tanks had been removed and the contents could not be sampled. Details on tank contents are presented in Appendix A.

2.4 TANK LEAK TESTING

Tank leak testing was conducted on 30 active USTs at UMDA. The leak testing included active tanks that had suitable fill tubes for leak testing equipment. According to the UST FSP (Dames & Moore, 1992a), 56 tanks were scheduled to be leak tested. However, as discussed in Section 2.2, 22 inactive USTs were not leak

tested as originally planned because UMDA scheduled to remove the tanks under a separate contract, and USTs 42 and 43 were not leak tested because they are equipped with a leak detection system. As discussed in Section 2.3, UST 58 was not leak tested because the contents could not be screened for the presence of chemical agents prior to completion of the tank leak testing program.

In addition, UST 11 was not tested because of difficulties encountered by UMDA personnel in scheduling delivery of bunker fuel (i.e., heating oil No. 5) to the tank. Fuel from UST 11 was originally transferred to other bunker fuel tanks (USTs 21 through 25) to expedite leak testing before the external tank heating coils were turned on for winter operation. (Because of the high viscosity of bunker fuel, it must be heated to deliver (i.e., pump) the product from the tanks to the boiler system. Testing of bunker fuel tanks is required before starting the external tank heating system because of complications when the fuel is not in thermal equilibrium.) UST 11 was eventually filled with bunker fuel, and an attempt was made to test the tank. However, the tank was not filled to the level required to conduct a certified test, which would have required a second order of bunker fuel--which might have caused a delay of several weeks. UMDA personnel did not permit Dames & Moore to fill the remaining portion of the tank with diesel fuel, which would have been sufficient to test the tank. In consultation with UMDA and USAEC, Dames & Moore canceled plans to test UST 11 because of the logistical difficulties and uncertainties in preparing it for testing. Therefore, soil sampling was conducted to determine whether UST 11 has leaked fuel to the environment. Chemical analysis results are presented in Section 3.0 with the UST-specific discussions.

The purpose of the tank leak tests was to evaluate tank integrity and, thus, to assess the potential for contamination due to a leak. If the test determined that a tank was leaking, potential soil contamination was investigated by collecting and chemically analyzing soil samples near the tank. Soil samples were also collected near tanks that had inconclusive tank leak test results to evaluate the presence of

potentially leaked tank contents. Results of the tank leak testing and soil sampling are presented in Section 3.0 with the UST-specific discussions and in Appendix B.

Tank leak testing was conducted using the Homer Ezy-Chek detection equipment and system. The Ezy-Chek method is based on temperature and volume and the theoretical coefficient of expansion and their relationship to each other. This method meets or exceeds all State, Federal, and National Fire Protection Association (NFPA) requirements.

Under the Ezy-Check method, a weighted temperature probe--consisting of platinum sensing wires encased in a coil spring of special plastic tubing--is lowered into the tank. The probe proportions the volume of the tank and accurately detects average temperature change (to 0.001°F), if any, when the product is stratified. In addition, low pressure air flows from an air supply tank to the bellows, which are connected to a plastic tube inserted into the top of the product. A pen recorder connected to the bellows monitors the head pressure of the product. If the product expands, increased pressure causes bubbling action, which moves the pen up the chart; if the volume decreases, the decrease in pressure causes the pen to move down the chart. The actual volume change is calculated using the head pressure change and the volume change due to temperature. In most cases, an average hourly volume change over 2 to 3 hours is recorded.

2.5 GEOPHYSICAL SURVEYS

Geophysical surveys were conducted to evaluate the presence of 20 USTs at 14 locations where USTs were reported by former or current UMDA personnel. Geophysical surveying techniques provide a cost-effective method to locate USTs in the absence of surface evidence such as fill pipes, vents, staining, surface depressions or mounds, etc. Because much of the information about these tanks was obtained from personal interviews, it was not certain whether the tanks actually existed and were removed or were abandoned in place. Limited geophysical surveys, using

magnetic and electromagnetic techniques, were performed at these locations to assess whether USTs or associated piping are present in the subsurface.

The geophysical surveys included the following USTs, some of which are grouped because of their proximity:

- USTs 59, 60, 61, and 62 (Site 43)
- UST 64
- UST 65
- USTs 76 and 77
- UST 79
- UST 80
- UST 81
- UST 82
- UST 84
- UST 86
- USTs 88, 89, and 90
- UST 91
- UST 99
- UST 102.

As shown on Plates 1 and 2, four of the potential UST sites (USTs 59, 60, 61, and 62; USTs 88, 89, and 90; UST 91; and UST 99) are located in the restricted area; the remaining 10 are located in the Administration Area.

Dames & Moore was not able to conduct a geophysical survey at UST 100, because metal from the surrounding shelter and stored material would have interfered with the magnetic field measurements.

Each geophysical survey consisted of a magnetometer survey and an electromagnetic (EM) survey. Magnetic and EM surveys were chosen because shallow ferrous metallic USTs produce both readily identifiable magnetic and EM anomalies.

Magnetometers and EM tools--which work on different principles and measure different properties--were used together to verify any observed anomalies.

The geophysical surveys consisted of the following sequential elements:

- Staking the reported location of the UST.
- Establishing a survey grid centered on the staked location of the UST.
- Adjusting the size of the survey grid to include additional suspect tank locations based on site evidence (i.e., possible vent brackets, asphalt patches, former boiler rooms, etc.).
- Producing a site map of the surveyed area to include cultural and natural features.
- Collecting both the magnetic and EM data.
- Processing and interpreting the data to identify any potential anomalies.
- Collecting additional data as needed.
- Marking locations of geophysical anomalies in the field.

Details of the methods used are presented in Appendix C, along with a summary of the interpretation from each of the 14 surveyed locations and the referenced contour maps with survey grids. Results of the geophysical surveys are presented in Section 3.0 with the UST-specific discussions.

2.6 SOIL GAS SURVEYS

2.6.1 Active Soil Gas Surveys

Active soil gas surveys were conducted at 17 locations where USTs were reported to exist, but had been removed or abandoned in place. The 17 sites included 13 of the tank sites surveyed by geophysical methods, two multiple-UST sites (two areas of Site 42), a diesel fuel spill location (Site 73), and one former single-UST site where a geophysical survey was not performed because of interference from

surrounding shelters (UST 100). Soil gas analysis for UST 65, which was scheduled for a geophysical survey, was included in the Site 73 investigation. A total of 454 soil gas samples were collected from a depth of approximately 3 feet. Results of the soil gas surveys are presented in Section 3.0 with the UST-specific discussions and in Appendix D (the active soil gas survey report).

A review of UMDA records and discussions with current or former UMDA employees provided no information on when (if ever) any of the former tanks and surrounding soil were removed. Prior to the investigation, it was unknown whether soil or groundwater at these sites was impacted by potentially leaking former USTs. Contamination may have been present if the former USTs had leaked during operational periods. Therefore, preliminary soil gas analyses were used in conjunction with geophysical surveys to determine potential contamination.

For those sites where geophysical surveys were performed, soil gas samples were collected within the same approximate area as the geophysical surveys using the active soil gas method. At the other sites, a 75- by 100-foot area was generally sampled. The purpose of the active soil gas surveys was to chemically analyze the organic portion of the vapor present in the unsaturated soil horizon around the reported UST location, and to quantitatively estimate the relative concentrations of major volatile components and degradation products of any potentially present petroleum fuels. The active soil gas survey is useful in defining source areas of volatiles soil contamination in areas where a tank may have been removed. If a tank had been removed and had leaked product to the surrounding soil during its past operation, the soil gas survey would also be useful in defining the horizontal extent of contamination. For sites with significant contamination, the soil gas surveys were useful in planning the soil sampling program.

The active soil gas survey methodology is summarized below:

- Soil gas samples were collected by extracting soil gas from the subsurface by vacuum through 0.75-inch-diameter hollow steel piping,

which was manually or pneumatically driven into the ground to a depth of approximately 3 feet. Where necessary, approximately 1-inch-diameter holes were drilled through asphalt to provide access to the subsurface. All holes were repaired by filling with sand to within a few inches of the surface, and then filling the remainder of the hole with concrete.

- Soil gas samples were analyzed in the field at the time of sample collection using a Hewlett Packard 5890 Series II gas chromatograph equipped with a flame ionization detector (FID) and a thermal conductivity detector (TCD). Details of the analytical method are presented in the active soil gas report (Appendix D).

- The FID is intended to detect benzene, toluene, xylenes, ethylbenzene (BTEX), and the C_1 through C_{16} hydrocarbons. Individual hydrocarbons in the C_1 through C_{16} range were not present at high enough concentrations to be individually reported; however, the sum of the individual hydrocarbon concentrations was reported as total volatile hydrocarbons (TVHC). TVHC is the most important parameter for detecting subsurface vapor related to hydrocarbon fuels.

- The TCD detector was used to detect methane and carbon dioxide, which are hydrocarbon biodegradation products. The occurrence of methane and carbon dioxide often correlates well with the fringe of the zone of contamination, because it is where biological activity is often prevalent. Such testing is also useful for old spills in which much of the original fuel product may have degraded. However, carbon dioxide is the ultimate oxidation product of organic compounds, whether produced by combustion or metabolism, and may represent the decomposition of naturally occurring or synthetic organic compounds.

A photoionization detector (PID) was not used, because it is insensitive to the C_1 through C_{16} hydrocarbons, which make up TVHC. The PID is more sensitive to the aromatic fuel fraction (BTEX); however, this advantage is more than offset by the inability of the PID to detect the C_1 through C_{16} hydrocarbons.

The soil gas survey grid for each UST typically consisted of 20 sample points arranged in four rows and five columns to provide a 75- by 100-foot rectangle. Soil gas samples were collected at 25- to 50-foot intervals. If the geophysical survey indicated the presence of an anomaly (i.e., potential UST), the soil gas grid was centered over the mapped location of the anomaly. If no anomaly was indicated by the geophysical survey, the grid was established over the mapped probable location of the UST, shown in Plates 1 and 2.

2.6.2 Passive Soil Gas Survey

A passive soil gas survey was conducted at Site 74, Oil/Fuel Transfer Station (Building 23), to evaluate potential contamination in areas where spills of oil and fuel from incoming railcars may have occurred. A passive soil gas survey was recommended at this site, because the site soil consists of loose gravel in a rail roadbed. (An active soil gas survey was expected to cause considerable disturbance of the loose gravel and subsurface gases, thereby volatilizing and dissipating potential contaminants prior to sample collection.) The Petrex static collection technique was used to collect and analyze soil gas samples. With this method, soil gas collectors were placed in the ground for 15 days. The sample collectors were then retrieved and shipped to a laboratory for analysis by mass spectrometry (MS) or gas chromatography (GC).

The passive soil gas methodology is summarized below:

- Thirty-two shallow boreholes were advanced to a depth of 1 foot using a coring shovel. The sample locations were arranged in a rectangular grid and spaced at 50-foot intervals.

- One passive soil gas collector was inserted open end down into each of the boreholes. Each soil gas collector consisted of a glass test tube containing two ferromagnetic Curie-point wires, with activated charcoal applied to the wire tips. All holes were backfilled, flagged, and numbered to correspond to exact locations on a survey grid.

- The collectors were left in the ground for 15 days and were retrieved, sealed, and express shipped to a laboratory for analysis. The 15-day exposure interval was determined by the results of time-calibration samplers, which were installed concurrently with the survey samplers and collected 7 days after installation.

- After the survey was completed, one of the collector wires from each test tube was analyzed by MS for volatile organic analyte (VOA) contamination (BTEX, tetrachloroethene (PCE), and trichloroethene (TCE)) to determine which compounds were present and should be mapped. The duplicate wire from selected sampler locations was analyzed by GC/MS to confirm the data.

- Quality assurance/quality control (QA/QC) samples of ambient air were also collected in the course of the survey.

Results of the passive soil gas survey are presented in Section 3.0 with the UST-specific discussions. A detailed passive soil gas report is provided in Appendix E.

2.7 SOIL BORINGS

Shallow soil borings were completed to confirm potential soil contamination at inactive UST sites that had significant soil gas contamination or at active UST sites that failed the leak test or had inconclusive results. Results of the soil sampling are presented in Section 3.0 with the UST-specific discussions.

Forty soil borings were completed at 10 locations. With the exception of borings installed near pipelines of active USTs, borings were generally drilled to a

depth of 10 feet. At UST 20, two of the three planned 10-foot borings could be driven only to a depth of 5 feet due to refusal. At UST 100, two borings had to be hand augured to a depth of 1.5 feet because of poor drill access and underground rig utility line interference. Where the total planned drilling depth was attained, soil samples were collected at 2.5-foot intervals. A headspace analysis was then performed on all the samples collected from each boring. Only the sample with the highest PID reading was submitted to the laboratory for chemical analysis. If no PID readings were detected at any depth, the sample collected from the maximum boring depth was submitted to the laboratory. At USTs 100 and 102 and at Sites 73 and 74, however, all samples collected from all borings were submitted for chemical analysis to obtain a complete vertical profile of potential soil contamination from surface spills.

Soil borings adjacent to supply pipelines at active USTs were drilled to a depth of approximately 8 feet, because pipelines are typically shallower than the USTs they serve. Soil samples were collected at 4- to 6-foot and 6- to 8-foot depths, and screened in the field for total VOAs using a PID. The sample with the highest reading was submitted for chemical analysis. If no PID readings were detected, the sample collected from a depth of 6 to 8 feet was submitted for chemical analysis.

A total of 82 soil samples were collected from the 10- and 8-foot borings and analyzed for Target Compound List (TCL) VOAs, TCL base neutral and acid extractable organics (BNAs), and total petroleum hydrocarbons (TPHCs). Procedures and field QA/QC protocols for soil sampling followed those described in the RI/FS FSP and QAPP (Dames & Moore, 1990b; 1990c).

2.8 SURVEYING

Soil sample locations were recorded in field notes by reference to the nearest survey monument, monitoring well, or permanent object whose position was clearly defined on a 7.5-minute U.S. Geological Survey (USGS) topographic map. Locations were determined by informal surveys, using either distance from two or more

benchmarks, or compass direction (adjusted for magnetic declination) and distance from the survey monument or other reference point.

2.9 FIELD QC SAMPLES

The types of field QC samples collected during the UST investigation are listed in Table 2-2 and described in detail below. The use of analytical results for these samples in the data validation effort is discussed in the RI/FS QAPP (Dames & Moore, 1990c).

- Equipment rinseate blank--This field QC sample is the final "analyte-free" water rinse from equipment cleaning collected daily during a sampling event. When soil samples were collected, one such sample per day was analyzed. The results are used to assess the levels of analytes present--to indicate the possibilities of inadequate sample equipment decontamination and of cross-contamination between samples collected using the same equipment. The rinseates are analyzed for the same parameters as the related samples. Equipment rinseate samples are associated with soil sampling only, because groundwater and UST samples are collected using dedicated bailers.

- Trip blank--A sample that originates from analyte-free water taken from the laboratory to the sampling site and returned to the laboratory with the volatile organic samples is referred to as a "trip blank." It is used to detect possible contamination introduced during sample handling and shipment, and also to detect possible contamination in the sample containers prior to use. One trip blank accompanied each cooler containing samples for VOA analysis; it was stored at the laboratory with the samples and analyzed by the laboratory. Trip blanks are analyzed only for VOAs. In this program, all VOA samples collected each day were shipped in a single cooler so as to limit the number of

TABLE 2-2

Information on Field QC Samples Collected
in the UMDA UST Investigation

Field QC Sample Type	Frequency	Site-Specific Analyses
Equipment rinseate blank	1 per matrix per day	All
Trip blank	1 per VOA shipment (or 1 per cooler containing VOA samples)	VOAs
Field duplicate	1 per 20 samples per sample matrix	All
Rinse water (prior to fieldwork)	1 per lot of water used	(a)
Drilling water (prior to fieldwork)	1 sample	(a)

VOA = volatile organic analyte.
(a) Sampled/analyzed as part of supplementary RI/FS field program.

trip blanks to one per day (though each trip blank consisted of two or three sample vials).

- Field duplicate--With the exception of soil samples for VOAs, field duplicates are collected for soil samples that will be homogenized and split. Samples for VOAs were not mixed, but select segments of soil were taken from the length of the core and placed in the sample containers provided by the laboratory. The duplicates for water samples were collected simultaneously. Field duplicates were collected at a frequency of approximately one per 20 per sample matrix. All duplicates were sent to the laboratory for analysis as normal samples. In general, the purpose of duplicate analysis is to check laboratory precision (i.e., comparability of data for duplicate samples analyzed separately). Field personnel attempted to collect duplicate samples where contamination was expected to be found to ensure positive results for assessment and comparison. A duplicate sample of the soil/sludge obtained from UST 92 was collected and analyzed.

- Rinse water--This is the distilled water used in sampling equipment decontamination. This sample is analyzed to detect the possible presence of contaminants, which can then be distinguished from actual site contamination not introduced from the rinse water source. As required by USAEC, one rinse water sample from each source of water used was collected and analyzed for all parameters of interest at UMDA. (Because only one lot of water was used, only one rinse water sample was collected. This sample was collected as part of the Supplementary RI/FS field program, which was scheduled concurrently with this investigation.)

- Drilling water--This is the source water used in well drilling and steam cleaning. One sample was collected as part of the Supplementary RI/FS field program from an on-post unchlorinated deep well source

designated by UMDA and approved for use by USAEC based on sample analysis results. The sample was collected prior to fieldwork and analyzed to ensure that contaminants are not introduced into soil borings and do not show up later in soil samples. Samples were analyzed for all constituents of interest at UMDA.

2.10 CHEMICAL ANALYSIS PROGRAM

Chemical analyses performed on soil samples collected during the UST investigation included the following parameters, which are representative of known or suspected site contaminants:

- TCL VOAs
- TCL semivolatile organics (BNAs)
- TPHCs.

Analyzed parameters were chosen based on the petroleum products present in the tanks. The analyses were performed by Environmental Science & Engineering, Inc. (ESE).

Part of the chemical analysis program involved data validation of chemical results. However, it should be noted that--in the USAEC Installation Restoration QA Program--data validation of chemical analysis results is performed primarily through the USAEC Installation Restoration Data Management Information System (IRDMIS), and additional validation by USAEC contractors is typically not required. (The USAEC data validation procedures are outlined in the QAPP (Dames & Moore 1990a). A summary of the USAEC IRDMIS data validation results is presented in Appendix F.) In addition, Dames & Moore reviewed the results for the field QC data, laboratory method blanks, and matrix spikes and surrogates. The manner in which these results were evaluated and used in the interpretation of data is discussed for each type of QC sample in Appendix G.

2.11 APPROACH TO ANALYSIS OF UST INVESTIGATION FIELD AND ANALYTICAL PROGRAM RESULTS

The evaluation of data collected during the UST investigation field and analytical program (outlined above) involves a synthesis of background information (from site reconnaissances, historic aerial photography, interviews with UMDA personnel, and previous investigations); evaluation of geotechnical and analytical data; and evaluation of chemical concentrations and comparison with regulatory standards and guidelines or background data, where available. Section 3.0 describes each UST or study site and evaluates the chemical data collected. UST-specific discussions are presented in the following format:

- Tank description and investigation--Includes a summary description of the UST or study site, operational history, and known or suspected contamination sources, based on discussions with UMDA personnel, records searches, and site reconnaissance. Relevant information from the historic aerial photointerpretation for Sites 42, 43, 73, and 74 is included. A summary of previous investigations--in terms of the objectives, sampling program, results, and conclusions--is presented if applicable. This section also presents details of the field and analytical program for the UST or study site.

- Contamination assessment--Evaluates the nature and extent of soil contamination at the UST location or study site by reviewing results of the analytical program and comparing these results to the comparison criteria (see below for further discussion) to assess the significance of the constituents detected in the environmental media. Where possible, detected contamination is related to past operations and known or suspected sources based on reports of UST contents or dumping, spills, overflows, etc., of materials or wastes at the site.

- Conclusions and recommendations--Evaluates contamination at the UST location or study site based on the contamination assessment and

provides recommendations for no further action, further investigation, or remediation, as appropriate.

The chemical analysis results are presented in Section 3.0. Data are reported by sample number and depth. Only compounds that were detected in at least one sample collected at an UST location or study site are presented in the results tables, rather than all constituents analyzed.

If a compound was not detected in a particular sample, it is marked by "LT" (less than; for USAEC-certified analyses) or "ND" (not detected; for non-USAEC-certified analyses), which indicates that the concentration of the constituent is below the Certified Reporting Limit (CRL) for USAEC-certified analyses, or below the laboratory detection limit for other analyses. Note that the CRLs are provided in the first column of each results table for comparison. "GT" (greater than) indicates a concentration not specifically quantified, because it is beyond the upper limit of the USAEC-certified range. If a compound or class of compounds was not analyzed for, it is marked by "NT" (not tested).

A number of flags may be included in the chemical results tables that are generated by USAEC's IRDMIS. These are defined in Appendix H.

In addition to the USAEC flags, the chemical results tables may include flags indicating that the compound was also detected in the associated method blank or trip blank. Where the flags are used, the result is considered to be due to laboratory contamination and not to site contamination; these results are treated as nondetected compounds and are not discussed in the text. If a detected constituent is a common laboratory contaminant (i.e., acetone, methylene chloride, methyl ethyl ketone, toluene, and various phthalate esters, according to U.S. Environmental Protection Agency (EPA) definition) and it was detected in the laboratory method blanks, and if the concentration is less than or equal to 10 times the concentration detected in the blank, it is flagged with a "B." The same rule applies to other laboratory contaminants

detected in blanks, except that the constituent is flagged with a "B" if the concentration is less than or equal to five times the concentration detected in the blank.

Comparisons of the maximum contaminant concentrations detected in all soil method blanks for this project with concentrations of the same contaminants detected in soil samples are presented in Table 2-3. Of the 34 soil method blanks analyzed in this investigation, five exhibited detectable levels of one or more contaminants. As presented in Table 2-3, the maximum site soil concentration of trichlorofluoromethane is less than five times the maximum concentration detected in soil method blanks; therefore, trichlorofluoromethane concentrations are considered to result from laboratory--not site-related--contamination and are not discussed further in site-specific contamination assessments presented in Section 3.0. Appendix G presents an evaluation of the compounds detected in the laboratory method blanks associated with this program.

Because no standard comparison criteria are available for the compounds analyzed for in the UST investigation, any detected concentrations of compounds greater than the detection limits or CRLs are flagged on the chemical results tables by brackets around the listed concentration. Results are also discussed qualitatively in the text (e.g., whether the concentrations are considered high or low). Exceptions to this are results flagged with a "B" (see above); these results are not bracketed if they exceed the detection limits or CRLs, because they are considered to be indicators of laboratory contamination.

Tentatively identified compounds (TICs) from GC/MS library searches are also presented in the chemical analysis tables. For TICs, USAEC requires that the laboratory provide the three best matches/possible compound identities based on computer library search (where possible) and the associated probability (expressed as a percentage) that each potential match is the true compound identity. The GC/MS performs these functions; this is then reviewed by a GC/MS analyst who decides which compound is the best match. This is what is presented for the known TICs in the tables, along with the estimated concentration. When a good match is not possible,

TABLE 2-3

Comparison of Concentrations of Constituents Detected in Soil Method Blanks With Those Detected in Site Soil Samples

Constituent	Maximum Concentration Detected in Soil Method Blanks ($\mu g/g$)	Method Blank Comparison Criteria(a) ($\mu g/g$)	Range of Concentrations Detected in Site Soil Samples ($\mu g/g$)
Di-n-butylphthalate	0.29	1.45	0.073 - 20.00
Dioctyl adipate	0.3	1.5	0.310 - 21.00
Trichlorofluoromethane	0.007	0.035	0.005 - 0.008

(a) Method blank comparison values are five times the maximum concentration detected in all method blanks.

these compounds are then designated as "unknown." Where applicable, the results tables present the number of unknown TICs for each sample (in parentheses), followed by the combined estimated concentration of the unknown TICs.

3.0 UST INVESTIGATION RESULTS AND ASSESSMENT

Section 3.0 presents detailed descriptions of each UST location or study site, the investigations performed, the results of the investigation and assessment of contamination, and conclusions and recommendations. Table 3-1 presents the results of the sampling of tank contents; Table 3-2 presents tank leak test results; and Table 3-3 summarizes active soil gas results. Note that carbon dioxide results from the soil gas survey are not shown on the figures presented later in this section, because the concentrations of carbon dioxide detected were highly variable and did not correlate well with the detections of other target compounds. Carbon dioxide results are presented in the results tables. Table 3-4 presents chemical analysis results for soil samples. Tank locations are shown on Plates 1 and 2.

3.1 UST 1

3.1.1 Tank Description and Investigation

UST 1 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located at the southwest corner of Building 201 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.1.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 1 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of surrounding soil is not expected to be a concern.

3.1.3 Conclusions and Recommendations

Because UST 1 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 1. However, because U.S. Army regulations require all USTs to be treated as regulated tanks,

TABLE 3-1
Chemical Analysis Results
Sampling of Tank Contents

Underground Storage Tank Data -- 03/02/94 Page #: 1

	CRLs		
UST ID		**UST-93**	**UST-96**	
SITEID		**WTAA003**	**WTAA004**	
FIELD ID		**UMUST*3**	**UMUST*4**	
S. DATE		**23-sep-1992**	**16-sep-1992**	
DEPTH (FT)		**0.0**	**0.0**	
MATRIX		**CSW**	**CSW**	**COMPARISON**
UNITS	*CRLs*	**UGL**	**UGL**	**CRITERIA**
TAL Inorganics				
ARSENIC	*2.54*	[14.7]	LT 2.54	NSA
CALCIUM	*500*	[5040]	LT 500	NSA
COBALT	*25*	LT 25	[44.5]	NSA
COPPER	*8.1*	[12.8]	[143]	NSA
IRON	*38.8*	[105]	[122000]	NSA
LEAD	*1.26*	LT 1.26	[480]	NSA
MAGNESIUM	*500*	[3690]	LT 500	NSA
MANGANESE	*2.75*	LT 2.75	[1950]	NSA
NICKEL	*34.3*	LT 34.3	[42.6]	NSA
POTASSIUM	*375*	[78900]	LT 375	NSA
SODIUM	*500*	[690000]	[15300]	NSA
VANADIUM	*11*	[12.9]	LT 11	NSA
ZINC	*21.1*	LT 21.1	[286]	NSA
Explosives	*NA*	None Detected	NT	NSA
TCL VOAs				
CHLOROFORM	*0.5*	LT 0.5	[1.1]	NSA
TOLUENE	*0.5*	LT 0.5	[0.82]	NSA
TRICHLOROETHYLENE	*0.5*	LT 0.5	[0.53]	NSA
VOA TICs				
DECANE	*NA*	ND	20 S	NSA
TOTAL UNKNOWN TICs	*NA*	ND	(2)60	NSA
TCL BNAs	*NA*	None Detected	None Detected	NSA
TOTAL UNKNOWN TICs	*NA*	(1)6	(14)130	NSA
TCL Pesticides/PCBs	*NA*	None Detected	None Detected	NSA
Other Compounds	*NA*	None Detected	None Detected	NSA

Table 3-1 (continued)

Underground Storage Tank Data -- 03/07/94 Page # : 2

UST ID		UST- 092	UST-98	UST-98	UST-101	
MAP ID		W0-2	W0-6	W0-6	W0-7	
SITEID		WTAA002	WTAA006	WTAA006D	WTAA007	
FIELD ID		UMUST*2	UMUST*6	UMUST*8	UMUST*7	
S. DATE		23-sep-1992	15-sep-1992	15-sep-1992	23-sep-1992	
DEPTH (FT)		0.0	0.0	0.0	0.0	
MATRIX		CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	CRITERIA
TAL Inorganics						
ALUMINUM	*2.35*	LT 2.35 B	[4610]	[4700]	NT	NSA
ANTIMONY	*7.14*	LT 71.4	[109]	[92.4]	NT	NSA
ARSENIC	*0.25*	LT 0.25 B	[2.07]	[1.85]	NT	NSA
BARIUM	*5.18*	NT	[404]	[289]	NT	NSA
BERYLLIUM	*0.6*	NT	[0.581]	LT 0.5	NT	NSA
CADMIUM	*0.7*	LT 0.7	[13.7]	[11.2]	NT	NSA
CALCIUM	*100*	NT	[11200]	[8790]	NT	NSA
CHROMIUM	*4.05*	LT 4.05 B	[21.2]	[17.7]	NT	NSA
COBALT	*1.42*	LT 1.42	[8.04]	[9.2]	NT	NSA
COPPER	*0.965*	LT 0.965 B	[260]	[174]	NT	NSA
IRON	*3.68*	LT 3.68 B	[21800]	[24100]	NT	NSA
LEAD	*0.177*	[1400]	[930]	[540]	NT	NSA
MAGNESIUM	*100*	LT 100 B	[5400]	[4940]	NT	NSA
MANGANESE	*2.05*	LT 2.05 B	[226]	[216]	NT	NSA
MERCURY	*0.05*	[9.89]	[0.911]	[0.76]	NT	NSA
NICKEL	*1.71*	LT 1.71	[66.3]	[65.9]	NT	NSA
POTASSIUM	*100*	NT	[1160]	[1110]	NT	NSA
SELENIUM	*0.25*	LT 2.42	[0.653]	[0.617]	NT	NSA
SILVER	*0.589*	NT	[0.741]	NT	NT	NSA
SODIUM	*100*	LT 100 B	[423]	[361]	NT	NSA
THALLIUM	*6.62*	LT 6.62	[8.97]	LT 6.62	NT	NSA
VANADIUM	*3.39*	NT	[88.3]	[98.5]	NT	NSA
ZINC	*8.03*	LT 8.03 B	[527]	[398]	NT	NSA
Explosives						
RDX	*0.587*	NT	[2.41]	[1.91]	NT	NSA
TCL VOAs						
BENZENE	*0.002*	[20]	LT 0.002	LT 0.002	NT	NSA
ETHYLBENZENE	*0.002*	[3000]	LT 0.002	LT 0.002	NT	NSA
TOLUENE	*0.001*	[3500]	LT 0.001	LT 0.001	NT	NSA
XYLENES	*0.002*	[20000]	LT 0.002	LT 0.002	NT	NSA
VOA TICs						
1-ETHYL-2-METHYLBENZENE	*NA*	300 S	ND	ND	NT	NSA
METHYLCYCLOHEXANE	*NA*	100 S	ND	ND	NT	NSA

Table 3-1 (continued)

Underground Storage Tank Data -- 03/07/94 Page # : 3

UST ID		UST-		UST-		UST-		UST-		
MAP ID		W0-2		W0-6		W0-6		W0-7		
SITEID		WTAA002		WTAA006		WTAA006D		WTAA007		
FIELD ID		UMUST*2		UMUST*6		UMUST*8		UMUST*7		
S. DATE		23-sep-1992		15-sep-1992		15-sep-1992		23-sep-1992		
DEPTH (FT)		0.0		0.0		0.0		0.0		
MATRIX		CSO		CSO		CSO		CSO		COMPARISON
UNITS	*CRLs*	UGG		UGG		UGG		UGG		CRITERIA
VOA TICs										
OCTANE	*NA*	100	S	ND		ND		NT		NSA
PROPYLBENZENE / N-PROPYLBENZENE	*NA*	150	S	ND		ND		NT		NSA
TOTAL UNKNOWN TICs	*NA*	(4)190		ND		ND		NT		NSA
TCL BNAs										
2-METHYLNAPHTHALENE	*0.049*	[12000]		LT 1		LT 1		NT		NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	[400]		LT 10		LT 10		NT		NSA
FLUORENE	*0.033*	[20]		LT 0.7		LT 0.7		NT		NSA
NAPHTHALENE	*0.037*	[8810]		LT 0.7		LT 0.7		NT		NSA
PCB-1016	*1.4*	NT		ND 20	R	ND 20	R	LT 1.76	K	NSA
PCB-1221	*1.4*	NT		ND 20	R	ND 20	R	LT 1.76	K	NSA
PCB-1232	*1.4*	NT		ND 20	R	ND 20	R	LT 1.76	K	NSA
PCB-1242	*1.4*	NT		ND 20	R	ND 20	R	LT 1.76	K	NSA
PCB-1248	*2*	NT		ND 40	R	ND 40	R	LT 1.76	K	NSA
PCB-1254	*2.3*	NT		ND 40	R	ND 40	R	LT 1.76	K	NSA
PCB-1260	*2.6*	NT		ND 60	R	ND 60	R	LT 1.76	K	NSA
PHENANTHRENE	*0.033*	[40]		LT 0.7		LT 0.7		NT		NSA
BNA TICs										
ETHYLBENZENE	*NA*	7010	S	ND		ND		ND		NSA
PROPYLBENZENE / N-PROPYLBENZENE	*NA*	6010	S	ND		ND		ND		NSA
TOLUENE	*NA*	8010	S	ND		ND		ND		NSA
TRIDECANE	*NA*	3000	S	ND		ND		ND		NSA
TOTAL UNKNOWN TICs	*NA*	(16)157000		(2)18		(2)12		ND		NSA
TCL Pesticides/PCBs										
DDD	*0.008*	NT		[0.21]		[0.15]		NT		NSA
DDE	*0.008*	NT		[0.029]		[0.025]		NT		NSA
DDT	*0.007*	NT		[0.16]		[0.11]		NT		NSA
PCB-1260	*0.08*	NT		[0.1]		[0.171]		NT		NSA
Pesticides/PCB TICs										
alpha-CHLORDANE	*0.018*	ND		0.007	S	0.006	S	ND		NSA

Table 3-1 (continued)

Underground Storage Tank Data -- 03/07/94 Page # : 4

	CRLs								COMPARISON CRITERIA
UST ID		UST-92	UST-98		UST-98		UST-101		
MAP ID		W0-2	W0-6		W0-6		W0-7		
SITEID		WTAA002	WTAA006		WTAA006D		WTAA007		
FIELD ID		UMUST*2	UMUST*6		UMUST*8		UMUST*7		
S. DATE		23-sep-1992	15-sep-1992		15-sep-1992		23-sep-1992		
DEPTH (FT)		0.0	0.0		0.0		0.0		
MATRIX		CSO	CSO		CSO		CSO		
UNITS		UGG	UGG		UGG		UGG		
Pesticides/PCB TICs									
gamma-CHLORDANE	*0.018*	ND	0.011	S	0.01	S	ND		NSA
Other Inorganics									
NITRATE/NITRITE	*0.6*	NT	[73	]	[46	]	NT		NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	NT	[857	]	[652	]	NT		NSA

GT = Greater Than
LT = Less Than
NA = Not Available
ND = Not Detected
NSA = No Standard Available
NT = Not Tested
[ ] = Detected concentration exceeds CRL.
C = Confirmed Result
U = Unconfirmed Result
( ) = Number of unknowns detected, followed by total estimated concentration.
Note: USAEC IRDMIS flagging codes are defined in Appendix H.

TABLE 3–2
Tank Leak Test Results

UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or INActive)	Surface Features (d)	Leak Test Required(e)	Leak Test Date	Leak Test Results gal/hr
UST 1	ORUM 1	1/Adm.	1	DF2	1,000	A	P	Y	09/22/1992	−0.0089
UST 2	ORUM 2	1 / Adm.	2	DF 2	1,000	A	P	Y	09/22/1992	−36.0 (f)
UST 3	ORUM 3	1 / Adm.	7	DF 2	1,000	A	P	Y	09/22/1992	−0.0088
UST 4	ORUM 4	1 / Adm.	10	DF 2	1,000	A	P	Y	09/22/1992	−0.0021
UST 6	ORUM 6	1 / Adm.	30	DF 2	1,000	A	P	Y	09/21/1992	−0.0055
UST 8	ORUM 8	1 / Adm.	33	DF 2	1,000	A	P	Y	09/21/1992	−0.0149
UST 9	ORUM 9	2 / VI	416	DF 2	3,000	A	P	Y	09/25/1992	−0.0058
UST 10	ORUM 10	2 / V	419	DF 2	1,002	A	P	Y	09/25/1992	−0.0021
UST 11	ORUM 11	2 / III	612	HT 5	15,194	A	P	Y	NT (d)(g)	NT (d)(g)
UST 12	ORUM 12	2 / III	617	DF 2	2,500	A	P	Y	09/24/1992	−0.1670
UST 13	ORUM 13	2 / II	208	DF 2	1,001	A	P	Y	09/24/1992	−0.0048
UST 14	ORUM 14	2 / II	622	DF 2	1,000	A	P	Y	09/24/1992	−0.0108
UST 15	ORUM 15	2 / IV	654	DF 2	4,006	A	P	Y	10/14/1992	−0.0132
UST 16	ORUM 16	2 / IV	655	DF 2	6,008	A	P	Y	11/16/1992	−0.0204
UST 17	ORUM 17	2 / IV	660	DF 2	10,310	A	P	Y	10/14/1992	Inconclusive
UST 18	ORUM 18	1 / Adm.	28	HT 5	15,194	A	P	Y	10/13/1992	Inconclusive
UST 19	ORUM 19	1 / Adm.	28	HT 5	8,000	A	P	Y	10/12/1992	−0.0326
UST 20	ORUM 20	1 / Adm.	37	HT 5	10,529	A	P	Y	10/13/1992	Inconclusive
UST 21	ORUM 21	1 / Adm.	31	HT 5	15,194	A	P	Y	10/12/1992	Inconclusive
UST 22	ORUM 22	1 / Adm.	31	HT 5	12,088	A	P	Y	10/13/1992	Inconclusive
UST 23	ORUM 23	1 / Adm.	31	HT 5	12,088	A	P	Y	10/13/1992	Inconclusive
UST 24	ORUM 24	2 / II	131	HT 5	15,194	A	P	Y	11/16/1992	−0.0124
UST 25	ORUM 25	2 / VI	433	HT 5	15,194	A	P	Y	10/14/1992	Inconclusive
UST 26	ORUM 26	1 / Adm.	15A	DF 2	675	A	P	Y	09/23/1992	−0.0057
UST 27	ORUM 27	1 / Adm.	15B	DF 2	675	A	P	Y	09/23/1992	−0.0072

TABLE 3–2 (continued)

UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or INActive)	Surface Features (d)	Leak Test Required(e)	Leak Test Date	Leak Test Results gal/hr
UST 28	ORUM 28	1 / Adm.	16A	DF 2	675	A	P	Y	09/23/1992	−0.0066
UST 29	ORUM 29	1 / Adm.	16B	DF 2	675	A	P	Y	09/23/1992	−0.0042
UST 30	ORUM 30	1 / Adm.	35	DF 2	375	A	P	Y	09/22/1992	−0.0019
UST 31	ORUM 31	1 / Adm.	55	DF 2	1,000	A	P	Y	09/22/1992	−0.0169
UST 32	ORUM 32	2 / II	116	DF 2	1,000	A	P	Y	09/23/1992	−0.0032
UST 33	ORUM 33	2 / II	129	DF 2	1,000	A	P	Y	09/23/1992	0.0026

a Tank designation from U.S. Army Corps of Engineers 1989, UMDA underground storage tank investigation.

b See enclosed Plates 1 and 2.

c DF2 = diesel fuel No. 2; HT5 = Heating oil No. 5.

d P = present; NP = not present; NT = Not Tested.

e Y = Yes.

f A shaded value indicates an exceedance of the State standard of 0.05 gal/hr.

g UST 11 was not leak tested but was investigated under the soil sampling program.

TABLE 3-3
Summary of Active Soil Gas Results

UST/Site No.	No. of Soil Gas Samples Collected	Benzene ug/L	Toluene ug/L	Ethylbenzene ug/L	Xylenes ug/L	TVHC ug/L	Carbon Dioxide ug/L	Methane ug/L
UST 64	20	0.06–0.5 (9) (a)	0.1–0.5 (5)	ND (b)	ND	0.4–3.0 (6)	800–3,400 (15)	ND
UST 76 & 77	40	0.05–1.0 (19)	0.08–1.0 (14)	0.5 (1)	ND	0.2–6.0 (16)	610–12,000 (40)	ND
UST 79	16	0.05–1.0 (13)	0.09–1.0 (7)	ND	ND	0.6–5.0 (11)	670–2,700 (16)	ND
UST 80	20	0.04–0.4 (13)	0.1–0.4 (7)	ND	ND	0.3–2.0 (6)	460–1,300 (20)	ND
UST 81	10	0.03–0.7 (9)	0.1–0.5 (8)	ND	ND	0.2–4.0 (8)	690–2,900 (10)	ND
UST 82	19	0.03–0.6 (16)	0.1–0.6 (11)	ND	ND	0.3–2.0 (10)	690–3,800 (19)	ND
UST 84	18	0.05–0.4 (11)	0.1–0.4 (5)	ND	ND	0.3–7.0 (11)	530–1,100 (18)	ND
UST 86	24	0.2 (2)	0.2 (2)	ND	ND	0.7–1.0 (3)	740–7,200 (24)	ND
USTs 88, 89, 90	60	0.08–0.9 (5)	0.2–0.7 (5)	ND	ND	0.6–4.0 (5)	940–4,800 (59)	ND
UST 91	20	0.07–2.0 (5)	0.1–2.0 (4)	ND	2.0 (1)	0.4–11 (5)	680–3,500 (20)	ND
UST 99	20	0.2–0.3 (2)	0.2 (2)	ND	ND	1.0 (2)	1,100–4,000 (20)	ND
UST 100	18	0.04–0.7 (10)	0.4–0.5 (2)	ND	1.0–2.0 (3)	0.4–110 (11)	1,100–10,000 (18)	ND
UST 102	29	0.06–0.7 (19)	0.1–20 (19)	ND	ND	0.3–60 (20)	660–1,900 (27)	ND
Site 42 East	22	0.04–0.5 (5)	0.2–1.0 (5)	ND	ND	0.5–13 (9)	700–32,000 (20)	ND
Site 42 West	37	0.06–0.2 (3)	0.2–0.4 (3)	ND	ND	1.0 (1)	770–6,500 (32)	ND
Site 43	25	0.04–0.2 (6)	0.1–0.3 (4)	ND	2.0–3.0 (2)	0.4–3.0 (5)	1,700–13,000 (25)	ND
Site 73	57	0.04–0.9 (18)	0.09–1.0 (23)	ND	ND	0.2–36 (28)	530–50,000 (54)	ND

(a) Value in parentheses is number of samples with analyte detections.
(b) ND = Not Detected.

TABLE 3-4
Chemical Analysis Results
Soil Samples

Underground Storage Tank Soil Data-- 03/02/94 Page # : 1

UST ID		UST-11	UST-11	UST-11	UST-11	UST-18	UST-18	UST-18	
MAP ID		S0-1	S0-2	S0-3	S0-4	S0-9	S0-10	S0-11	
SITEID		STAA001	STAA002	STAA003	STAA004	STAA009	STAA010	STAA011	
FIELD ID		UMUS*1	UMUS*6	UMUS*11	UMUS*16	UMUS*35	UMUS*40	UMUS*45	
S. DATE		21-sep-1993	21-sep-1993	21-sep-1993	21-sep-1993	20-sep-1993	20-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	10.0	10.0	6.5	10.0	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	0.007 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	ND	ND	0.021 S	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(1)0.007	ND	(1)0.03	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	[0.74]	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	0.41 B	0.24 B	20 B	0.42 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	[0.28 1]	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	7.5 SB	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	0.32 S	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	0.86 S	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 2

	CRLs								COMPARISON CRITERIA
UST ID		UST-11	UST-11	UST-11	UST-11	UST-18	UST-18	UST-18	
MAP ID		S0-1	S0-2	S0-3	S0-4	S0-9	S0-10	S0-11	
SITEID		STAA001	STAA002	STAA003	STAA004	STAA009	STAA010	STAA011	
FIELD ID		UMUS*1	UMUS*6	UMUS*11	UMUS*16	UMUS*35	UMUS*40	UMUS*45	
S. DATE		21-sep-1993	21-sep-1993	21-sep-1993	21-sep-1993	20-sep-1993	20-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	10.0	10.0	6.5	10.0	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	0.32 S	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	(12)4.6	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.5	LT 28.5	LT 28.5	LT 28.5	LT 28.7	LT 28.7	[95.2]	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data-- 03/02/94 Page # : 3

UST ID		UST-18	UST-20	UST-20	UST-20	UST-20	UST-21	UST-21	
MAP ID		S0-12	S0-13	S0-14	S0-15	S0-16	S0-17	S0-18	
SITEID		STAA012	STAA013	STAA014	STAA015	STAA016	STAA017	STAA018	
FIELD ID		UMUS*50	UMUS*52	UMUS*57	UMUS*62	UMUS*67	UMUS*69	UMUS*74	
S. DATE		19-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	19-sep-1993	20-sep-1993	
DEPTH (FT)		6.5	5.0	5.0	10.0	6.5	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	CRLs	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.2	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	[2]	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	[3]	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 1 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	0.007 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	[10]	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	0.007 S	ND	ND	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	(2)110	ND	ND	(1)0.007	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.2	[40]	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 3	[6]	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.8	[1]	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	LT 0.3 B	0.6 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 1	LT 1	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.3	LT 0.3	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.2	[4]	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 1	[4]	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.2	[10]	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.2	[10]	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.2	[1]	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	100 S	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	30 S	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94	Page # : 4								
UST ID		UST-18	UST-20	UST-20	UST-20	UST-20	UST-21	UST-21	
MAP ID		S0-12	S0-13	S0-14	S0-15	S0-16	S0-17	S0-18	
SITEID		STAA012	STAA013	STAA014	STAA015	STAA016	STAA017	STAA018	
FIELD ID		UMUS*50	UMUS*52	UMUS*57	UMUS*62	UMUS*67	UMUS*69	UMUS*74	
S. DATE		19-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	19-sep-1993	20-sep-1993	
DEPTH (FT)		6.5	5.0	5.0	10.0	6.5	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	30 S	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	20 S	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	(19)10830	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	[312]	[13900]	[36.5]	[41]	LT 28.7	LT 28.5	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 5

UST ID		UST-22	UST-22	UST-22	UST-23	UST-23	UST-21-23	UST-25	
MAP ID		S0-19	S0-20	S0-20	S0-21	S0-22	S0-23	S0-24	
SITEID		STAA019	STAA020	STAA020D	STAA021	STAA022	STAA023	STAA024	
FIELD ID		UMUS*79	UMUS*84	UMUS*220	UMUS*86	UMUS*91	UMUS*96	UMUS*101	
S. DATE		19-sep-1993	20-sep-1993	20-sep-1993	19-sep-1993	20-sep-1993	20-sep-1993	20-sep-1993	
DEPTH (FT)		10.0	10.0	10.0	6.5	10.0	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	0.007 B	LT 0.006 B	LT 0.006 B	0.008 B	0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(1)0.009	ND	(1)0.007	(1)0.007	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

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UST ID		UST-22	UST-22	UST-22	UST-23	UST-23	UST-21-23	UST-25	
MAP ID		S0-19	S0-20	S0-20	S0-21	S0-22	S0-23	S0-24	
SITEID		STAA019	STAA020	STAA020D	STAA021	STAA022	STAA023	STAA024	
FIELD ID		UMUS*79	UMUS*84	UMUS*220	UMUS*86	UMUS*91	UMUS*96	UMUS*101	
S. DATE		19-sep-1993	20-sep-1993	20-sep-1993	19-sep-1993	20-sep-1993	20-sep-1993	20-sep-1993	
DEPTH (FT)		10.0	10.0	10.0	6.5	10.0	10.0	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.8	LT 28.5	LT 28.8	LT 28.8	LT 28.7	LT 28.7	[40.5]	NSA

TABLE 3-4 (continued)

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	CRLs								COMPARISON CRITERIA
UST ID		UST-25	UST-25	UST-25	UST-100	UST-100	UST-100	UST-100	
MAP ID		S0-25	S0-26	S0-27	S0-28	S0-28	S0-28	S0-28	
SITEID		STAA025	STAA026	STAA027	STAA028	STAA028	STAA028	STAA028	
FIELD ID		UMUS*103	UMUS*108	UMUS*113	UMUS*118	UMUS*119	UMUS*120	UMUS*121	
S. DATE		21-sep-1993	20-sep-1993	21-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	10.0	6.5	0.0	2.5	5.0	7.5	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS		UGG	UGG	UGG	UGG	UGG	UGG	UGG	
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYLHEXANOL	*NA*	ND	ND	ND	ND	ND	0.01 S	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(1)0.03	ND	(1)0.02	ND	(1)0.005	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.5	[0.64]	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	LT 6	[1]	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 2	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	0.11 B	LT 0.061 B	0.17 B	LT 0.6 B	LT 0.061 B	LT 0.061 B	0.49 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 2	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.7	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.3	[0.22]	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 2	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.4	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.3	[0.58]	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.3	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	0.72 S	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	3.1 S	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	1 S	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	2.1 S	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	3.1 S	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94	Page # : 8								
UST ID		UST-25	UST-25	UST-25	UST-100	UST-100	UST-100	UST-100	
MAP ID		S0-25	S0-26	S0-27	S0-28	S0-28	S0-28	S0-28	
SITEID		STAA025	STAA026	STAA027	STAA028	STAA028	STAA028	STAA028	
FIELD ID		UMUS*103	UMUS*108	UMUS*113	UMUS*118	UMUS*119	UMUS*120	UMUS*121	
S. DATE		21-sep-1993	20-sep-1993	21-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	10.0	6.5	0.0	2.5	5.0	7.5	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	2.1 S	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	3.1 S	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	1 S	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	(15)522	ND	(1)0.3	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.5	LT 28.8	LT 28.7	[337]	[860]	LT 28.7	LT 28.7	NSA

TABLE 3-4 (continued)

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	CRLs								COMPARISON CRITERIA
UST ID		UST-100	UST-100	UST-100	UST-100	UST-100	UST-100	UST-100	
MAP ID		S0-28	S0-29	S0-29	S0-30	S0-30	S0-30	S0-31	
SITEID		STAA028	STAA029	STAA029	STAA030	STAA030	STAA030D	STAA031	
FIELD ID		UMUS*122	UMUS*123	UMUS*124	UMUS*125	UMUS*126	UMUS*221	UMUS*130	
S. DATE		19-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	0.0	1.5	0.0	1.5	1.5	0.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS		UGG	UGG	UGG	UGG	UGG	UGG	UGG	
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	(1)0.004	ND	(1)0.004	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.5	LT 0.049	LT 0.5	LT 0.049	LT 0.5	LT 1	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 6	LT 0.62	LT 6	LT 0.62	LT 6	LT 10	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 2	LT 0.17	LT 2	LT 0.17	LT 2	LT 3	NSA
DI-N-BUTYL PHTHALATE	*0.061*	0.33 B	LT 0.6 B	LT 0.061 B	LT 0.6 B	LT 0.061 B	LT 0.6 B	LT 1 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 2	LT 0.19	LT 2	LT 0.19	LT 2	LT 4	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.7	LT 0.068	[0.9]	LT 0.068	LT 0.7	LT 1	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.3	LT 0.033	LT 0.3	LT 0.033	LT 0.3	LT 0.7	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 2	LT 0.19	LT 2	LT 0.19	LT 2	LT 4	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.4	LT 0.037	LT 0.4	LT 0.037	LT 0.4	LT 0.7	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.3	LT 0.033	[0.4]	LT 0.033	LT 0.3	LT 0.7	NSA
PYRENE	*0.033*	LT 0.033	LT 0.3	LT 0.033	LT 0.3	LT 0.033	LT 0.3	LT 0.7	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	0.33 S	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

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UST ID		UST-100	UST-100	UST-100	UST-100	UST-100	UST-100	UST-100	
MAP ID		S0-28	S0-29	S0-29	S0-30	S0-30	S0-30	S0-31	
SITEID		STAA028	STAA029	STAA029	STAA030	STAA030	STAA030D	STAA031	
FIELD ID		UMUS*122	UMUS*123	UMUS*124	UMUS*125	UMUS*126	UMUS*221	UMUS*130	
S. DATE		19-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	28-sep-1993	19-sep-1993	
DEPTH (FT)		10.0	0.0	1.5	0.0	1.5	1.5	0.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	(1)0.3	(1)3	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	[1140]	[489]	[911]	[341]	[1660]	[3320]	NSA

TABLE 3-4 (continued)

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UST ID		UST-100	UST-100	UST-100	UST-100	UST-101	UST-101	UST-101	
MAP ID		S0-31	S0-31	S0-31	S0-31	S0-32	S0-33	S0-34	
SITEID		STAA031	STAA031	STAA031	STAA031	STAA032	STAA033	STAA034	
FIELD ID		UMUS*131	UMUS*132	UMUS*133	UMUS*134	UMUS*135	UMUS*140	UMUS*145	
S. DATE		19-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	21-sep-1993	21-sep-1993	21-sep-1993	
DEPTH (FT)		2.5	5.0	7.5	10.0	6.5	6.5	6.5	
		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	0.006 B	0.007 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	ND	ND	0.005 S	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	(1)0.01	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	0.1 B	0.56 B	0.71 B	1.1 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	0.42 SB	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

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UST ID		UST-100	UST-100	UST-100	UST-100	UST-101	UST-101	UST-101	
MAP ID		S0-31	S0-31	S0-31	S0-31	S0-32	S0-33	S0-34	
SITEID		STAA031	STAA031	STAA031	STAA031	STAA032	STAA033	STAA034	
FIELD ID		UMUS*131	UMUS*132	UMUS*133	UMUS*134	UMUS*135	UMUS*140	UMUS*145	
S. DATE		19-sep-1993	19-sep-1993	19-sep-1993	19-sep-1993	21-sep-1993	21-sep-1993	21-sep-1993	
DEPTH (FT)		2.5	5.0	7.5	10.0	6.5	6.5	6.5	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	(1)0.3	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	LT 28.7	LT 28.8	LT 28.8	LT 28.8	LT 28.8	LT 28.5	NSA

TABLE 3-4 (continued)

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UST ID		UST-101	UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	
MAP ID		S0-35	S0-36	S0-36	S0-36	S0-36	S0-37	S0-37	
SITEID		STAA035	STAA036	STAA036	STAA036	STAA036	STAA037	STAA037	
FIELD ID		UMUS*150	UMUS*152	UMUS*153	UMUS*155	UMUS*156	UMUS*157	UMUS*158	
S. DATE		21-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH		6.5	0.0	2.5	7.5	10.0	0.0	2.5	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	0.006 B	0.007 B	LT 0.006 B	LT 0.006 B	0.006 B	0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	0.073 S	ND	ND	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	0.009 S	NSA
TOTAL UNKNOWN TICs	*NA*	(1)0.005	ND	ND	ND	(1)0.006	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	LT 0.62	[14]	LT 0.62	[0.77]	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	0.16 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 14

UST ID		UST-101	UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	
MAP ID		S0-35	S0-36	S0-36	S0-36	S0-36	S0-37	S0-37	
SITEID		STAA035	STAA036	STAA036	STAA036	STAA036	STAA037	STAA037	
FIELD ID		UMUS*150	UMUS*152	UMUS*153	UMUS*155	UMUS*156	UMUS*157	UMUS*158	
S. DATE		21-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		6.5	0.0	2.5	7.5	10.0	0.0	2.5	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	0.31 S	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	LT 28.7	LT 28.5	LT 28.8	LT 28.8	[35.5]	[35.5]	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 15

UST ID		UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	
MAP ID		S0-37	S0-37	S0-38	S0-38	S0-38	S0-38	S0-38	
SITEID		STAA037	STAA037	STAA038	STAA038	STAA038	STAA038	STAA038	
FIELD ID		UMUS*160	UMUS*161	UMUS*162	UMUS*163	UMUS*164	UMUS*165	UMUS*166	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		7.5	10.0	0.0	2.5	5.0	7.5	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	0.006 B	LT 0.006 B	0.007 B	0.008 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	0.021 S	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(1)0.007	ND	ND	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	[0.83]	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	0.12 B	0.17 B	0.34 B	0.24 B	0.096 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	[0.09]	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	[0.04]	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	[0.11]	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 16

UST ID		UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	UST-102	
MAP ID		S0-37	S0-37	S0-38	S0-38	S0-38	S0-38	S0-38	
SITEID		STAA037	STAA037	STAA038	STAA038	STAA038	STAA038	STAA038	
FIELD ID		UMUS*160	UMUS*161	UMUS*162	UMUS*163	UMUS*164	UMUS*165	UMUS*166	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		7.5	10.0	0.0	2.5	5.0	7.5	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.5	LT 28.7	LT 28.7	LT 28.7	LT 28.7	[35.7]	LT 28.7	NSA

TABLE 3-4 (continued)

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MAP ID		S73-1	S73-1	S73-1	S73-1	S73-2	S73-2	S73-2	
SITEID		S73A001	S73A001	S73A001	S73A001	S73A002	S73A002	S73A002	
FIELD ID		UMUS*187	UMUS*188	UMUS*189	UMUS*190	UMUS*192	UMUS*193	UMUS*194	
S. DATE		18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	
DEPTH (FT)		0.0	2.5	5.0	10.0	0.0	2.5	5.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	COMPARISON CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	ND	ND	ND	ND	ND	ND	0.005 S	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.5	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 6	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 2	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.6 B	LT 0.061 B	0.13 B	0.15 B	0.45 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 2	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.7	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.3	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 2	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.4	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.3	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.3	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 18

MAP ID		S73-1	S73-1	S73-1	S73-1	S73-2	S73-2	S73-2	
SITEID		S73A001	S73A001	S73A001	S73A001	S73A002	S73A002	S73A002	
FIELD ID		UMUS*187	UMUS*188	UMUS*189	UMUS*190	UMUS*192	UMUS*193	UMUS*194	
S. DATE		18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	
DEPTH (FT)		0.0	2.5	5.0	10.0	0.0	2.5	5.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	[804]	[79.9]	[39.1]	LT 28.8	[38]	LT 28.7	[37.3]	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 19

MAP ID		S73-2	S73-3	S73-3	S73-3	S73-3	S73-3	S74-1	
SITEID		S73A002	S73A003	S73A003	S73A003	S73A003	S73A003	S74A001	
FIELD ID		UMUS*195	UMUS*197	UMUS*198	UMUS*199	UMUS*200	UMUS*201	UMUS*202	
S. DATE		18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	17-sep-1993	
DEPTH (FT)		10.0	0.0	2.5	5.0	7.5	10.0	0.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	[0.001]	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	0.01 S	ND	0.007 S	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	(1)0.006	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	LT 0.061 B	0.082 B	0.33 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	0.42 S	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	1 S	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

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MAP ID		S73-2	S73-3	S73-3	S73-3	S73-3	S73-3	S74-1	
SITEID		S73A002	S73A003	S73A003	S73A003	S73A003	S73A003	S74A001	
FIELD ID		UMUS*195	UMUS*197	UMUS*198	UMUS*199	UMUS*200	UMUS*201	UMUS*202	
S. DATE		18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	18-sep-1993	17-sep-1993	
DEPTH (FT)		10.0	0.0	2.5	5.0	7.5	10.0	0.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	(1)0.4	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	LT 28.7	LT 28.7	LT 28.7	LT 28.7	LT 28.7	LT 28.7	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 21

	CRLs								COMPARISON CRITERIA
MAP ID		S74-1	S74-1	S74-1	S74-1	S74-2	S74-2	S74-2	
SITEID		S74A001	S74A001	S74A001	S74A001	S74A002	S74A002	S74A002	
FIELD ID		UMUS*203	UMUS*204	UMUS*205	UMUS*206	UMUS*207	UMUS*208	UMUS*209	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		2.5	5.0	7.5	10.0	0.0	2.5	5.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS		UGG	UGG	UGG	UGG	UGG	UGG	UGG	
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	[0.005]	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	LT 0.006 B	LT 0.006 B	0.006 B	LT 0.006 B	LT 0.006 B	NSA
XYLENES	*0.002*	[0.033]	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	0.041 S	0.01 S	0.006 S	ND	ND	ND	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(2)0.013	ND	ND	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	LT 0.049	LT 0.049	LT 0.2	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	[6.1]	LT 0.62	LT 0.62	LT 3	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	LT 0.17	LT 0.17	LT 0.8	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.061 B	LT 0.3 B	0.073 B	LT 0.061 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 1	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	LT 0.068	LT 0.068	LT 0.3	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.2	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	LT 0.19	LT 0.19	LT 1	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	LT 0.037	LT 0.037	LT 0.2	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.2	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	LT 0.033	LT 0.033	LT 0.2	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
EICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

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MAP ID		S74-1	S74-1	S74-1	S74-1	S74-2	S74-2	S74-2	
SITEID		S74A001	S74A001	S74A001	S74A001	S74A002	S74A002	S74A002	
FIELD ID		UMUS*203	UMUS*204	UMUS*205	UMUS*206	UMUS*207	UMUS*208	UMUS*209	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		2.5	5.0	7.5	10.0	0.0	2.5	5.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	LT 28.7	LT 28.7	LT 28.7	[199]	LT 28.7	LT 28.7	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94   Page # : 23

	CRLs								COMPARISON CRITERIA
MAP ID		S74-2	S74-2	S74-3	S74-3	S74-3	S74-3	S74-3	
SITEID		S74A002	S74A002	S74A003	S74A003	S74A003	S74A003	S74A003	
FIELD ID		UMUS*210	UMUS*211	UMUS*212	UMUS*213	UMUS*214	UMUS*215	UMUS*216	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		7.5	10.0	0.0	2.5	5.0	7.5	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	
UNITS		UGG	UGG	UGG	UGG	UGG	UGG	UGG	
TCL VOAs									
CHLOROFORM	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
ETHYLBENZENE	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
TOLUENE	*0.001*	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	LT 0.001	NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006 B	LT 0.006 B	0.006 B	LT 0.006 B	LT 0.006 B	0.005 B	LT 0.006 B	NSA
XYLENES	*0.002*	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	LT 0.002	NSA
VOA TICs									
2-ETHYHEXANOL	*NA*	0.022 S	ND	ND	ND	ND	0.005 S	ND	NSA
DODECANE	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	ND	ND	ND	ND	ND	ND	NSA
TCL BNAs									
2-METHYLNAPHTHALENE	*0.049*	LT 0.049	LT 0.049	NT	LT 0.049	LT 0.049	LT 0.049	LT 0.049	NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	LT 0.62	[0.8]	NT	LT 0.62	LT 0.62	LT 0.62	LT 0.62	NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17	LT 0.17	NT	LT 0.17	LT 0.17	LT 0.17	LT 0.17	NSA
DI-N-BUTYL PHTHALATE	*0.061*	LT 0.061 B	[20 B]	NT	LT 0.061 B	LT 0.061 B	LT 0.061 B	1.2 B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19	LT 0.19	NT	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
FLUORANTHENE	*0.068*	LT 0.068	LT 0.068	NT	LT 0.068	LT 0.068	LT 0.068	LT 0.068	NSA
FLUORENE	*0.033*	LT 0.033	LT 0.033	NT	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19	LT 0.19	NT	LT 0.19	LT 0.19	LT 0.19	LT 0.19	NSA
NAPHTHALENE	*0.037*	LT 0.037	LT 0.037	NT	LT 0.037	LT 0.037	LT 0.037	LT 0.037	NSA
PHENANTHRENE	*0.033*	LT 0.033	LT 0.033	NT	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
PYRENE	*0.033*	LT 0.033	LT 0.033	NT	LT 0.033	LT 0.033	LT 0.033	LT 0.033	NSA
BNA TICs									
1-METHYLNAPHTHALENE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
2-Ethylhexanoic acid	*NA*	ND	0.42 S	NT	ND	ND	ND	0.41 S	NSA
DECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
DIACETONE ALCOHOL	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
DIOCTYL ADIPATE	*NA*	ND	21 SB	NT	ND	ND	ND	0.31 S	NSA
EICOSANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
HENEICOSANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
HEPTADECANE	*NA*	ND	0.53 S	NT	ND	ND	ND	ND	NSA
HEXADECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94		Page # : 24							
MAP ID		S74-2	S74-2	S74-3	S74-3	S74-3	S74-3	S74-3	
SITEID		S74A002	S74A002	S74A003	S74A003	S74A003	S74A003	S74A003	
FIELD ID		UMUS*210	UMUS*211	UMUS*212	UMUS*213	UMUS*214	UMUS*215	UMUS*216	
S. DATE		17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	17-sep-1993	
DEPTH (FT)		7.5	10.0	0.0	2.5	5.0	7.5	10.0	
MATRIX		CSO	CSO	CSO	CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs									
MESITYL OXIDE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	0.42 S	NT	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	0.32 S	NT	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	NT	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	ND	(10)6.6	NT	ND	ND	ND	ND	NSA
Other Compounds									
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.7	[56.6]	[1540]	LT 28.7	LT 28.7	LT 28.7	LT 28.7	NSA

TABLE 3-4 (continued)

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MAP ID		S74-3		S73-1		S73-3		S74-3		
SITEID		S74A003D		S73A001D		S73A003D		S74A003		
FIELD ID		UMUS*217		UMUS*218		UMUS*219		UMUS*222		
S. DATE		17-sep-1993		18-sep-1993		18-sep-1993		29-sep-1993		
DEPTH (FT)		2.5		2.5		7.5		0.0		
MATRIX		CSO		CSO		CSO		CSO		COMPARISON
UNITS	*CRLs*	UGG		UGG		UGG		UGG		CRITERIA
TCL VOAs										
CHLOROFORM	*0.001*	LT 0.001		LT 0.001		LT 0.001		NT		NSA
ETHYLBENZENE	*0.002*	LT 0.002		LT 0.002		LT 0.002		NT		NSA
TOLUENE	*0.001*	LT 0.001		LT 0.001		LT 0.001		NT		NSA
TRICHLOROFLUOROMETHANE	*0.006*	LT 0.006	B	LT 0.006	B	LT 0.006	B	NT		NSA
XYLENES	*0.002*	LT 0.002		LT 0.002		LT 0.002		NT		NSA
VOA TICs										
2-ETHYHEXANOL	*NA*	0.01	S	ND		ND		NT		NSA
DODECANE	*NA*	ND		ND		ND		NT		NSA
TOTAL UNKNOWN TICs	*NA*	ND		ND		ND		NT		NSA
TCL BNAs										
2-METHYLNAPHTHALENE	*0.049*	LT 0.049		LT 0.049		LT 0.049		LT 0.5		NSA
BIS(2-ETHYLHEXYL) PHTHALATE	*0.62*	[1.2	]	LT 0.62		LT 0.62		LT 6		NSA
BUTYLBENZYL PHTHALATE	*0.17*	LT 0.17		LT 0.17		LT 0.17		LT 2		NSA
DI-N-BUTYL PHTHALATE	*0.061*	[20	B]	LT 0.061	B	LT 0.061	B	LT 0.6	B	NSA
DI-N-OCTYL PHTHALATE	*0.19*	LT 0.19		LT 0.19		LT 0.19		LT 2		NSA
FLUORANTHENE	*0.068*	LT 0.068		LT 0.068		LT 0.068		LT 0.7		NSA
FLUORENE	*0.033*	LT 0.033		LT 0.033		LT 0.033		LT 0.3		NSA
N-NITROSODIPHENYLAMINE	*0.19*	LT 0.19		LT 0.19		LT 0.19		LT 2		NSA
NAPHTHALENE	*0.037*	LT 0.037		LT 0.037		LT 0.037		LT 0.4		NSA
PHENANTHRENE	*0.033*	LT 0.033		LT 0.033		LT 0.033		LT 0.3		NSA
PYRENE	*0.033*	LT 0.033		LT 0.033		LT 0.033		LT 0.3		NSA
BNA TICs										
1-METHYLNAPHTHALENE	*NA*	ND		ND		ND		ND		NSA
2,6,10,14-TETRAMETHYLPENTADECANE	*NA*	ND		ND		ND		ND		NSA
2-Ethylhexanoic acid	*NA*	ND		ND		ND		ND		NSA
DECANE	*NA*	ND		ND		ND		ND		NSA
DIACETONE ALCOHOL	*NA*	ND		ND		ND		ND		NSA
DIOCTYL ADIPATE	*NA*	21	SB	ND		ND		ND		NSA
EICOSANE	*NA*	ND		ND		ND		ND		NSA
HENEICOSANE	*NA*	ND		ND		ND		ND		NSA
HEPTADECANE	*NA*	0.31	S	ND		ND		ND		NSA
HEXADECANE	*NA*	ND		ND		ND		ND		NSA

TABLE 3-4 (continued)

Underground Storage Tank Soil Data -- 03/02/94 Page # : 26

MAP ID		S74-3	S73-1	S73-3	S74-3	
SITEID		S74A003D	S73A001D	S73A003D	S74A003	
FIELD ID		UMUS*217	UMUS*218	UMUS*219	UMUS*222	
S. DATE		17-sep-1993	18-sep-1993	18-sep-1993	29-sep-1993	
DEPTH (FT)		2.5	2.5	7.5	0.0	
MATRIX		CSO	CSO	CSO	CSO	COMPARISON
UNITS	*CRLs*	UGG	UGG	UGG	UGG	CRITERIA
BNA TICs						
MESITYL OXIDE	*NA*	ND	ND	ND	ND	NSA
NONADECANE	*NA*	ND	ND	ND	ND	NSA
NONYL PHENOL	*NA*	ND	ND	ND	ND	NSA
OCTADECANE	*NA*	ND	ND	ND	ND	NSA
TETRADECANE	*NA*	ND	ND	ND	ND	NSA
TRIDECANE	*NA*	ND	ND	ND	ND	NSA
UNDECANE	*NA*	ND	ND	ND	ND	NSA
TOTAL UNKNOWN TICs	*NA*	(9)4.4	ND	ND	ND	NSA
Other Compounds						
TOTAL PETROLEUM HYDROCARBONS	*100*	LT 28.8	LT 28.7	LT 28.7	NT	NSA

GT = Greater Than
LT = Less Than
NA = Not Available
ND = Not Detected
NSA = No Standard Available
NT = Not Tested
[ ] = Detected concentration exceeds comparison criterion
C = Confirmed Result
U = Unconfirmed Result
( ) = Number of unknowns detected, followed by total estimated concentration.
Note: USAEC IRDMIS flagging codes are defined in Appendix H.

UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.2 UST 2

3.2.1 Tank Description and Investigation

UST 2 is a diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located at the northwest corner of Building 002 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.2.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results show that UST 2 exceeded the tightness criterion of 0.05 gallon per hour (gph), indicating that there is a potential for contamination of the surrounding soil if the tank is leaking.

3.2.3 Conclusions and Recommendations

There is a potential that fuel has leaked to the soil surrounding UST 2 via the tank, pipeline, or tank and pipe connections. UST 2 is being removed by UMDA with appropriate closure under State of Oregon regulations. Following tank removal, it is recommended that UMDA collect soil samples near UST 2 and associated pipelines to evaluate the potential for contamination.

3.3 UST 3

3.3.1 Tank Description and Investigation

UST 3 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located east of Building 007 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.3.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 3 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.3.3 Conclusions and Recommendations

Because UST 3 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 3. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.4 UST 4

3.4.1 Tank Description and Investigation

UST 4 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located at the northeast corner of Building 10 in the Administration Area (See Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.4.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 4 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.4.3 Conclusions and Recommendations

Because UST 4 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 4. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.5 UST 6

3.5.1 Tank Description and Investigation

UST 6 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located at the western end of Building 30 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.5.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 6 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.5.3 Conclusions and Recommendations

Because UST 6 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 6. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.6 UST 8

3.6.1 Tank Description and Investigation

UST 8 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located west of Building 33 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.6.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 8 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be concern.

3.6.3 Conclusions and Recommendations

Because UST 8 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 8. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.7 UST 9

3.7.1 Tank Description and Investigation

UST 9 is an active diesel fuel tank with an estimated capacity of 3,000 gallons. The tank is located in the northeast corner of Area VI (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.7.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 9 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.7.3 Conclusions and Recommendations

Because UST 9 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 9. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.8 UST 10

3.8.1 Tank Description and Investigation

UST 10 is an active diesel fuel tank with an estimated capacity of 1,002 gallons. The tank is located in the southeast corner of Area V (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.8.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 10 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.8.3 Conclusions and Recommendations

Because UST 10 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 10. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.9 UST 11

3.9.1 Tank Description and Investigation

UST 11 is an active heating oil tank with an estimated capacity of 15,194 gallons. The tank is located in the northern end of Area III (see Plate 2). Because a tank leak test could not be performed on UST 11 (as discussed in Section 2.4), but the tank is still included in the UST investigation, the surrounding soil was sampled. Three 10-foot borings (STA-1 through STA-3) were installed near the tank and tank/ supply pipeline juncture. No PID readings were detected in any of the borings. Therefore, as discussed in Section 2.7, soil samples collected from a depth of 10 feet were submitted for chemical analysis. One 8-foot boring (STA-4) was installed near the pipeline, and a sample was collected from a depth of 6.5 feet--the depth of the

highest PID reading. Samples were analyzed for TCL VOAs, TCL BNAs, and TPHCs. Soil sample locations are shown on Figure 3-1.

3.9.2 Contamination Assessment

As presented in Table 3-4, no TCL VOAs or TPHCs were detected at UST 11. Only one TCL BNA--di-n-butyl phthalate--was detected in all four samples, with concentrations ranging from 0.24 to 20 micrograms per gram ($\mu g/g$). However, three of the detected concentrations are considered to be laboratory-related contamination; only one sample (STA-3) is considered to be site-related. A very low concentration of one unknown VOA TIC was detected in two samples. Low concentrations of four BNA TICs and 12 unknown BNA TICs were detected in one soil sample (STA-3). Based on these results, the potential for stored fuel from this UST leaking to the surrounding soil is expected to be low and is not considered to be a concern.

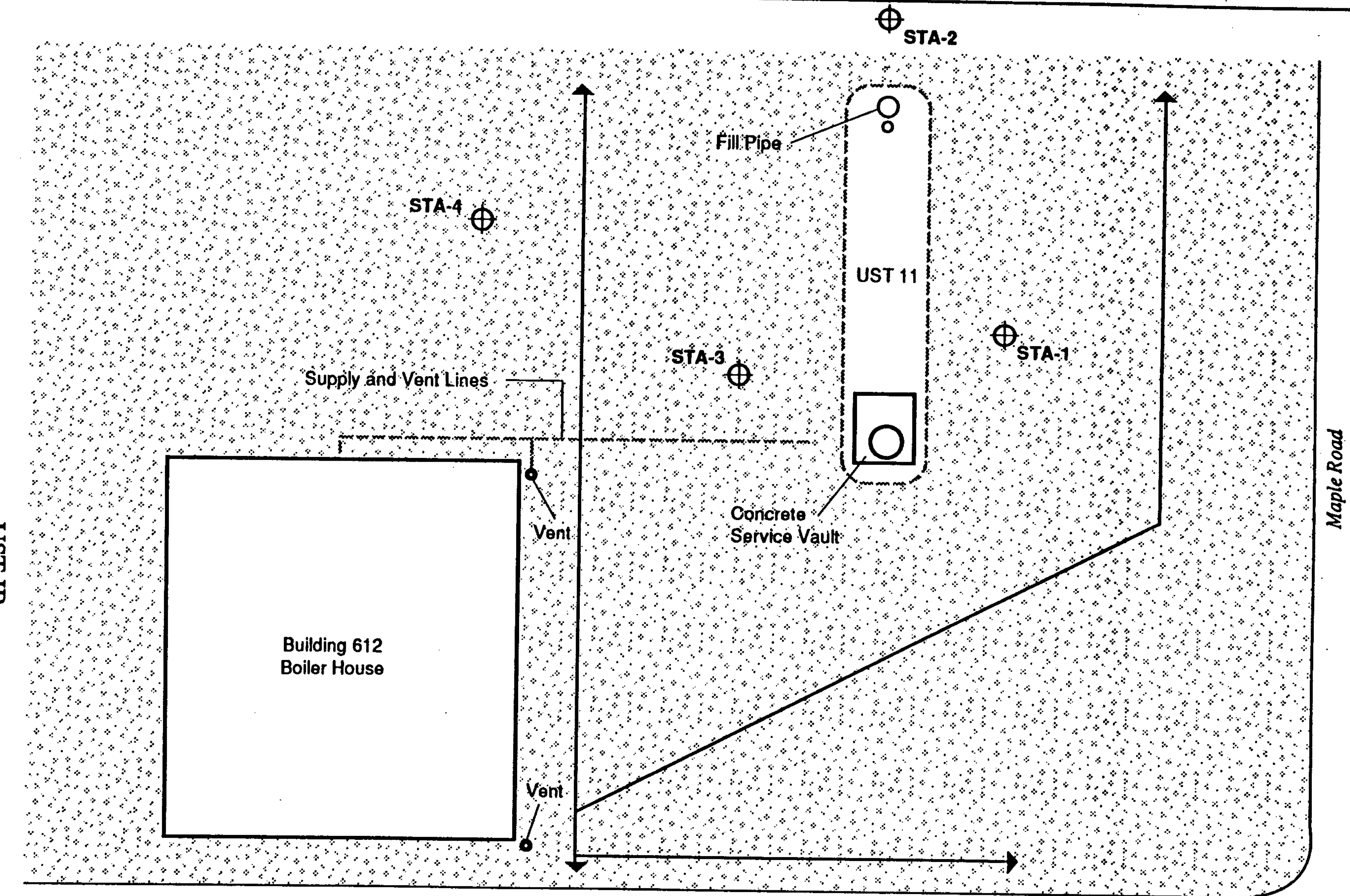
3.9.3 Conclusions and Recommendations

No TCL VOAs or TPHCs were detected in soil at UST 11, and only one TCL BNA was detected at low concentrations. Because the potential for contamination at UST 11 is low, no immediate action is recommended. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.10 UST 12

3.10.1 Tank Description and Investigation

UST 12 is a diesel fuel tank with an estimated capacity of 2,500 gallons. The tank is located in the northwest corner of Area III (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.



LEGEND

⊕ Soil Sample Location

Gravelly Soil & Scattered Grass

------ Indicates Underground Structure

N

0 10 Feet
Scale

Figure 3-1
UST 11
SOIL SAMPLE LOCATIONS

DAMES & MOORE

3.10.2 Contamination Assessment

Tank leak test results are presented in Table 3-2. The results show that UST 12 exceeded the tightness criterion of 0.05 gph, indicating that there is a potential for contamination of the surrounding soil if the tank is leaking.

3.10.3 Conclusions and Recommendations

There is a potential that fuel has leaked to the soil surrounding UST 12 via the tank, pipeline, or tank and pipe connections. Therefore, UST 12 is being removed by UMDA, with appropriate closure under State of Oregon regulations. Following tank removal, it is recommended that UMDA collect soil samples near the tank location and associated pipelines to evaluate the potential for contamination.

3.11 UST 13

3.11.1 Tank Description and Investigation

UST 13 is an active diesel fuel tank with an estimated capacity of 1,001 gallons. The tank is located in the northwest corner of Area II (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.11.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 13 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.11.3 Conclusions and Recommendations

Because UST 13 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 13. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.12 UST 14

3.12.1 Tank Description and Investigation

UST 14 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located midway along the western boundary of Area III (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.12.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 14 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.12.3 Conclusions and Recommendations

Because UST 14 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 14. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.13 UST 15

3.13.1 Tank Description and Investigation

UST 15 is an active diesel fuel tank with an estimated capacity of 4,006 gallons. The tank is located along the western boundary of Area IV (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.13.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 15 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.13.3 Conclusions and Recommendations

Because UST 15 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 15. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.14 UST 16

3.14.1 Tank Description and Investigation

UST 16 is an active diesel fuel tank with an estimated capacity of 6,008 gallons. The tank is located along the western boundary of Area IV (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.14.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 16 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.14.3 Conclusions and Recommendations

Because UST 16 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 16. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.15 UST 17

3.15.1 Tank Description and Investigation

UST 17 is an active diesel fuel tank with an estimated capacity of 10,310 gallons. The tank is located along the southern boundary of Area IV (see Plate 2). Tank leak testing was conducted to evaluate tank integrity. Soil sampling was also planned at UST 17, but because of security regulations involving the tank's location in K Block, clearance could not be obtained and no soil samples were collected.

3.15.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results for UST 17 were inconclusive, because the fuel product in the tank exhibited unstable temperature readings--which did not allow proper calibration of the testing equipment. For this reason, and because soil sampling could not be conducted because the site was located in the chemical agent storage area, it was not possible to evaluate potential contamination of the surrounding soil.

3.15.3 Conclusions and Recommendations

Because of the inconclusive results of the tank leak test, and because soil samples could not be collected as part of this investigation, it is recommended that UMDA collect several soil samples adjacent to UST 17, the tank/pipeline juncture, and the pipeline to evaluate the potential for contamination. Samples should be collected from a depth of approximately 10 feet near the tank and 6.5 feet near the pipeline. The samples should be analyzed for TCL VOAs, TCL BNAs, and TPHCs.

3.16 UST 18

3.16.1 Tank Description and Investigation

UST 18 is an active diesel fuel tank with an estimated capacity of 15,194 gallons. The tank is located east of Building 28 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity. Three soil borings (STA-9 through STA-11) were completed to a depth of 10 feet near the tank.

No PID readings were detected in any of the borings. Therefore, as discussed in Section 2.7, soil samples collected at the 10-foot depth at each boring were submitted for chemical analysis. One soil boring (STA-12) was completed to a depth of 6.5 feet near the pipeline; based on PID readings, this soil sample was submitted for chemical analysis. All samples were analyzed for TCL VOAs, TCL BNAs, and TPHCs. Soil sample locations are shown in Figure 3-2.

3.16.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results for UST 18 were inconclusive, because the fuel product in the tank exhibited unstable temperature readings--which did not allow proper calibration of the testing equipment. Soil samples were collected because of these inconclusive results. As presented in Table 3-4, a very low concentration (0.28 $\mu g/g$) of only one TCL BNA--di-n-octyl phthalate--was detected in only one soil sample (STA-9). TPHCs were detected at a concentration of 95.2 $\mu g/g$ in only one soil sample (STA-11). No other TCL BNAs or TPHCs were detected, and no TCL VOAs were detected. A very low concentration of one VOA TIC was detected in two samples (STA-11 and STA-12). Although TPHCs were detected in one soil sample, the concentration was below 100 $\mu g/g$, a level often used to determine whether remediation is required. Also, none of the soil samples exhibited PID readings, indicating that what little contamination may be present appears to be limited. Based on these results, the potential for stored fuel from this UST to leak to the surrounding soil is expected to be low and is not considered to be a concern.

3.16.3 Conclusions and Recommendations

Although tank leak test results were inconclusive, no TCL VOAs were detected in soil at UST 18, and TPHCs and one TCL BNA were detected in only one sample--each at low concentrations. Because the potential for contamination at this tank is low, no immediate action is recommended for UST 18. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider

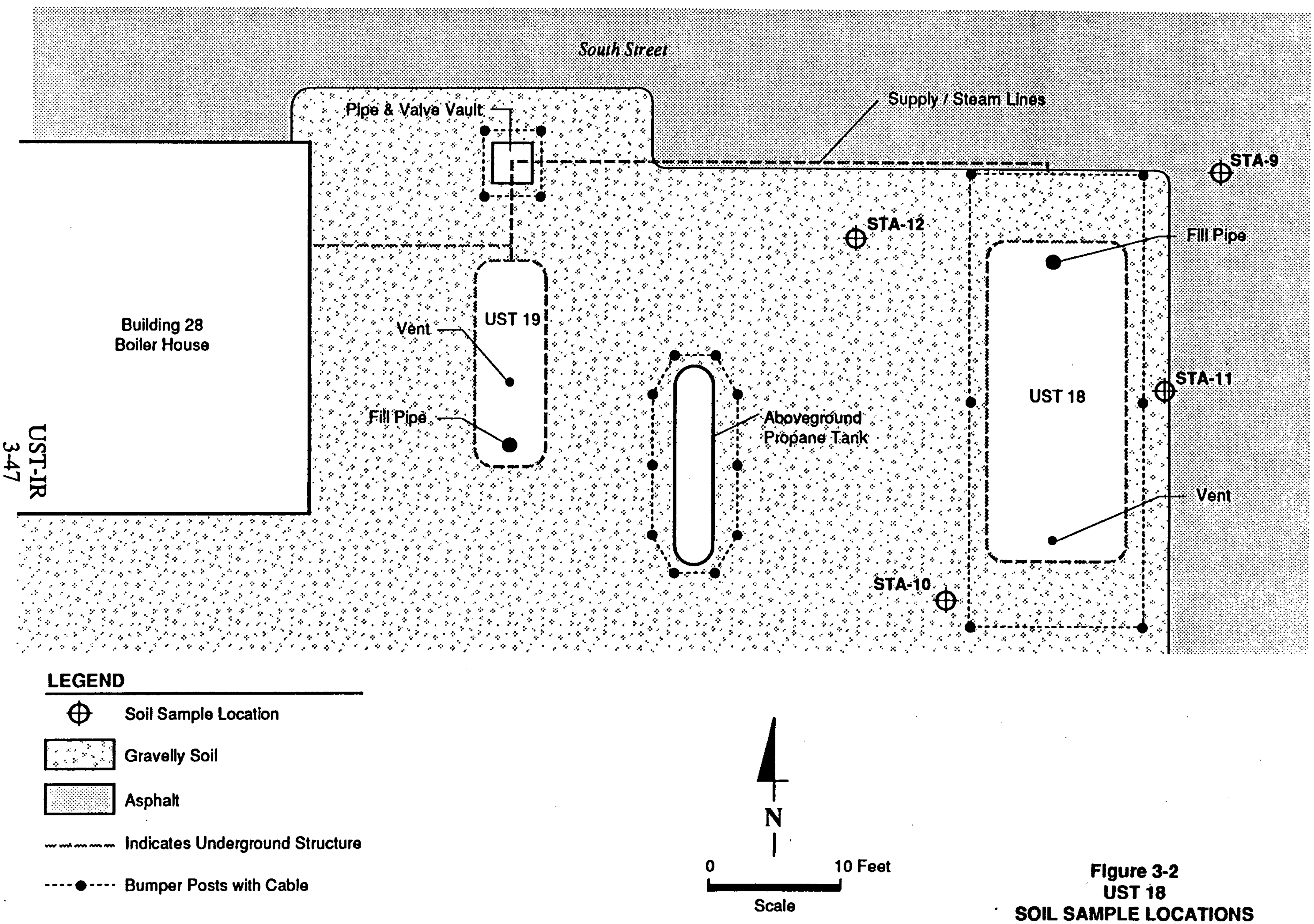


Figure 3-2
UST 18
SOIL SAMPLE LOCATIONS

DAMES & MOORE

annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.17 UST 19

3.17.1 Tank Description and Investigation

UST 19 is an active diesel fuel tank with an estimated capacity of 8,000 gallons. The tank is located east of Building 28 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.17.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 19 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.17.3 Conclusions and Recommendations

Because UST 19 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 19. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.18 UST 20

3.18.1 Tank Description and Investigation

UST 20 is an active heating oil tank with an estimated capacity of 10,529 gallons. The tank is located southeast of Building 37 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity. Four soil borings were also installed at UST 20. One soil boring (STA-15) was completed to a depth of 10 feet near the tank. Two of the soil borings (STA-13 and STA-14)--planned to be installed to a depth of 10 feet--were terminated at a depth of 5 feet due

to auger refusal. A fourth soil boring (STA-16) was completed to a depth of 6.5 feet near the pipeline. Volatiles were detected using a PID at a 5-foot depth in borings STA-13 and STA-14. No PID readings were detected in borings STA-15 or STA-16. Therefore, as discussed in Section 2.7, samples collected from the final depth of these four borings were submitted for chemical analysis. All soil samples were analyzed for TCL VOAs, TCL BNAs, and TPHCs. Soil sample locations are shown in Figure 3-3.

3.18.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results for UST 20 were inconclusive, because the fuel product in the tank exhibited unstable temperature readings--which did not allow proper calibration of the testing equipment. Soil samples were collected because of these inconclusive results. As presented in Table 3-4, low levels of three TCL VOAs and eight TCL BNAs were detected in sample STA-14, which was collected at a depth of 5 feet northwest of UST 20. Two unknown VOA TICs, four TCL BNA TICs, and 19 unknown BNA TICs were detected in one soil sample (STA-14). No TCL VOAs or TCL BNAs were detected in the other three samples. TPHCs were detected in all four samples, with concentrations ranging from 36.5 to a maximum of 13,900 μg/g in sample STA-14. In addition, in boring STA-13, a PID detected 2.6 parts per million (ppm) volatiles in the 5-foot sample and a strong odor was noted. In boring STA-14, 11.2 ppm volatiles were detected at 5 feet and there was a strong petroleum odor. Based on the chemical analysis results, stored fuel from this UST appears to have leaked to the surrounding soil.

3.18.3 Conclusions and Recommendations

Although tank leak test results were inconclusive, TPHCs were detected at low-to-high concentrations in soil at UST 20, indicating that fuel stored in this tank has leaked to the surrounding soil. Therefore, it is recommended that UST 20 be excavated and removed, and that the contaminated soil surrounding the tank be excavated and properly disposed of.

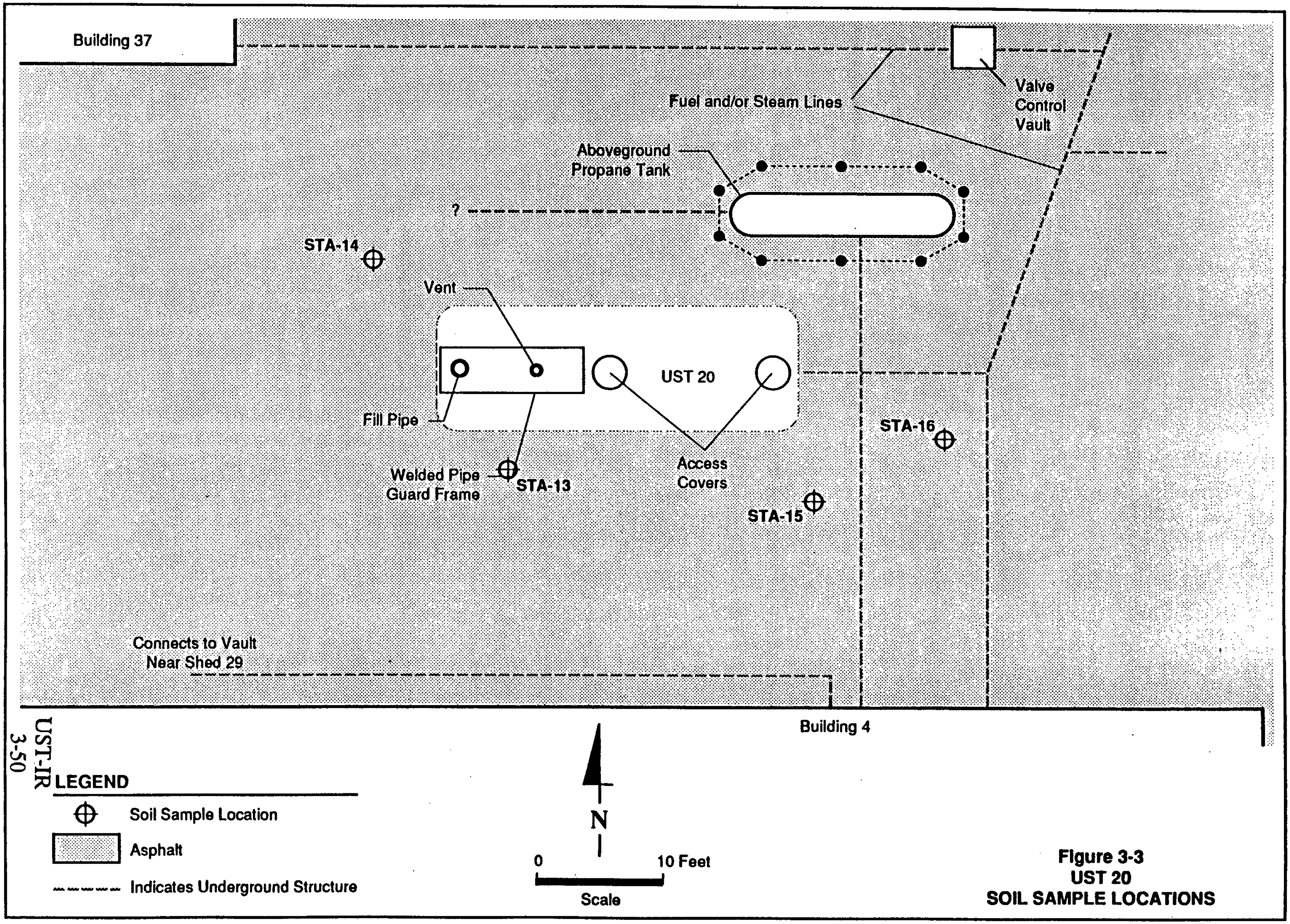


Figure 3-3
UST 20
SOIL SAMPLE LOCATIONS

3.19 USTs 21 to 23

3.19.1 Tank Description and Investigation

USTs 21, 22, and 23 are active heating oil tanks located along the northern wall of Building 31 in the Administration Area (see Plate 1). UST 21 has an estimated capacity of 15,194 gallons, and USTs 22 and 23 have estimated capacities of 12,088 gallons each. Tank leak testing was conducted to evaluate tank integrity. Six 10-foot-deep soil borings (STA-17 through STA-22) were also installed near the three tanks, with one boring on either side of each tank. An additional boring (STA-23) was installed near the supply pipeline to a depth of 6.5 feet. No PID readings were detected in any of the seven borings. Therefore, as discussed in Section 2.7, soil samples for chemical analysis were collected from the maximum boring depths in each boring. All samples were analyzed for TCL VOAs, TCL BNAs, and TPHCs. Soil sample locations are shown in Figure 3-4.

3.19.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results for USTs 21 to 23 were inconclusive, because the fuel product in the tanks exhibited unstable temperature readings--which did not allow proper calibration of the testing equipment. Soil samples were collected because of these inconclusive results. As presented in Table 3-4, no TCL VOAs, TCL BNAs, or TPHCs were detected in soil. Low levels of only one unknown VOA TIC were detected in four of the soil samples. Based on chemical analysis results, the potential for stored fuel from these tanks to leak to the surrounding soil is expected to be low and is not considered to be a concern.

3.19.3 Conclusions and Recommendations

Although tank leak test results for USTs 21 to 23 were inconclusive, no TCL VOAs, TCL BNAs, or TPHCs were detected in soil at the tanks. No immediate action is recommended for USTs 21 to 23, because the potential for contamination is low. However, because U.S. Army regulations require all USTs to be treated as

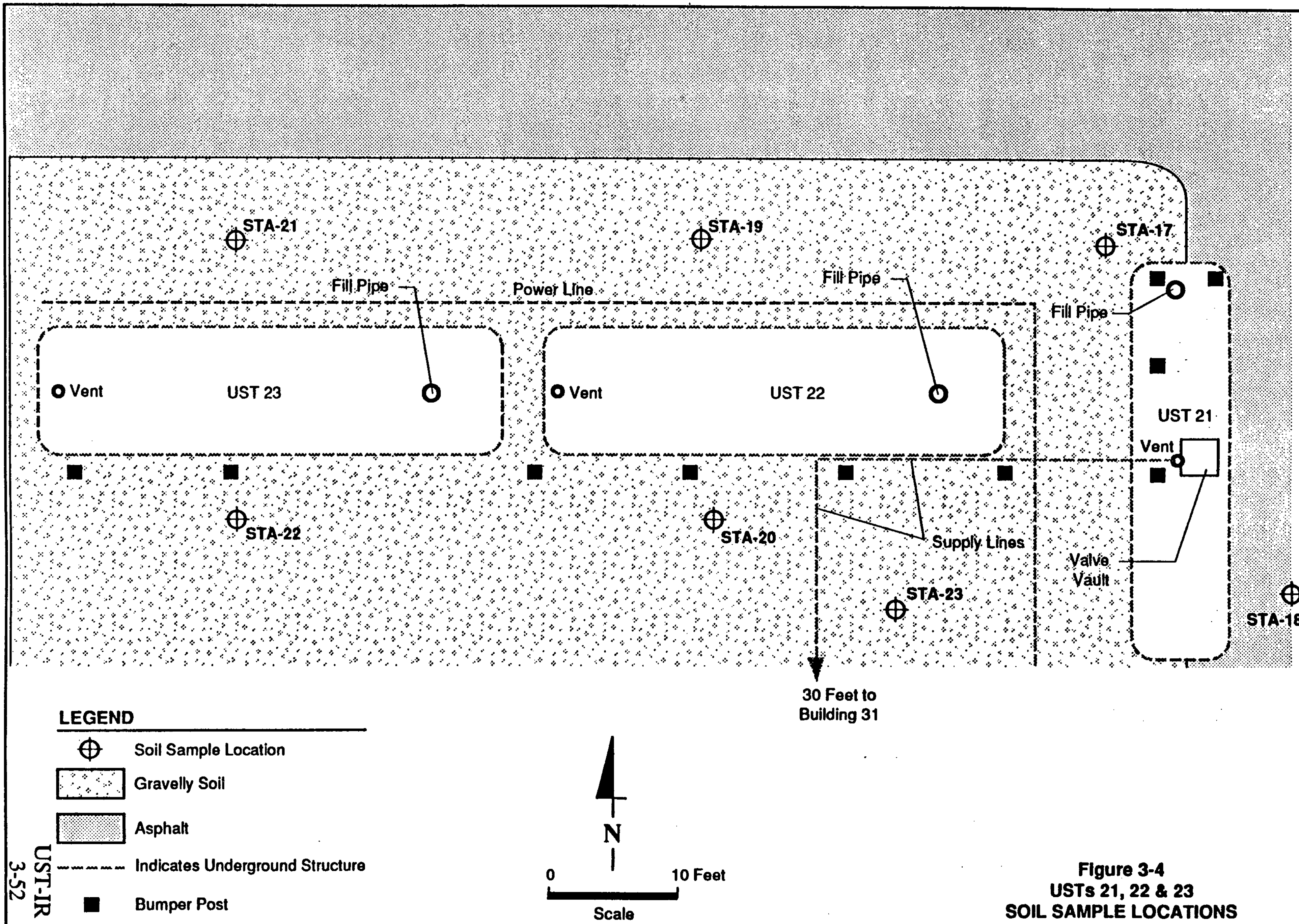


Figure 3-4
USTs 21, 22 & 23
SOIL SAMPLE LOCATIONS

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regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.20 UST 24

3.20.1 Tank Description and Investigation

UST 24 is an active diesel fuel tank with an estimated capacity of 15,194 gallons. The tank is located in the central portion of Area II (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.20.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 24 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.20.3 Conclusions and Recommendations

Because UST 24 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 24. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.21 UST 25

3.21.1 Tank Description and Investigation

UST 25 is an active heating oil tank with an estimated capacity of 15,194 gallons. The tank is located near the southwest corner of Area VII (see Plate 2). Tank leak testing was conducted to evaluate tank integrity. Four soil borings (STA-24 through STA-27) were installed around UST 25. No PID readings were detected in borings STA-24 through STA-26, though volatiles were detected with a PID in boring STA-27 at the maximum boring depth of 6.5 feet. Therefore, as discussed in Section

2.7, soil samples were collected from the maximum depth of 10 feet in STA-24, STA-25, and STA-26 and from a depth of 6.5 feet in STA-27. All soil samples were analyzed for TLC VOAs, TCL BNAs, and TPHCs. Soil sample locations are shown in Figure 3-5.

3.21.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results for UST 25 were inconclusive, because the fuel product in the tanks exhibited unstable temperature readings--which did not allow proper calibration of the testing equipment. Soil samples were collected because of these inconclusive results. As indicated in Table 3-4, no TCL VOAs or BNAs were detected in any of the samples, and only one unknown VOA TIC was detected in two samples. TPHCs were detected in only one soil sample, at a low concentration of 40.5 $\mu g/g$. A PID reading of 3.0 ppm was noted at a depth of 6.5 feet in boring STA-27. Based on chemical analysis results, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern.

3.21.3 Conclusions and Recommendations

Although tank leak test results for UST 25 were inconclusive, TPHCs were detected in only one soil sample, at a low concentration. Because the potential for contamination is low, no immediate action is recommended for UST 25. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.22 UST 26

3.22.1 Tank Description and Investigation

UST 26 is an active diesel fuel tank with an estimated capacity of 675 gallons. The tank is located at the northwest corner of Building 15 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

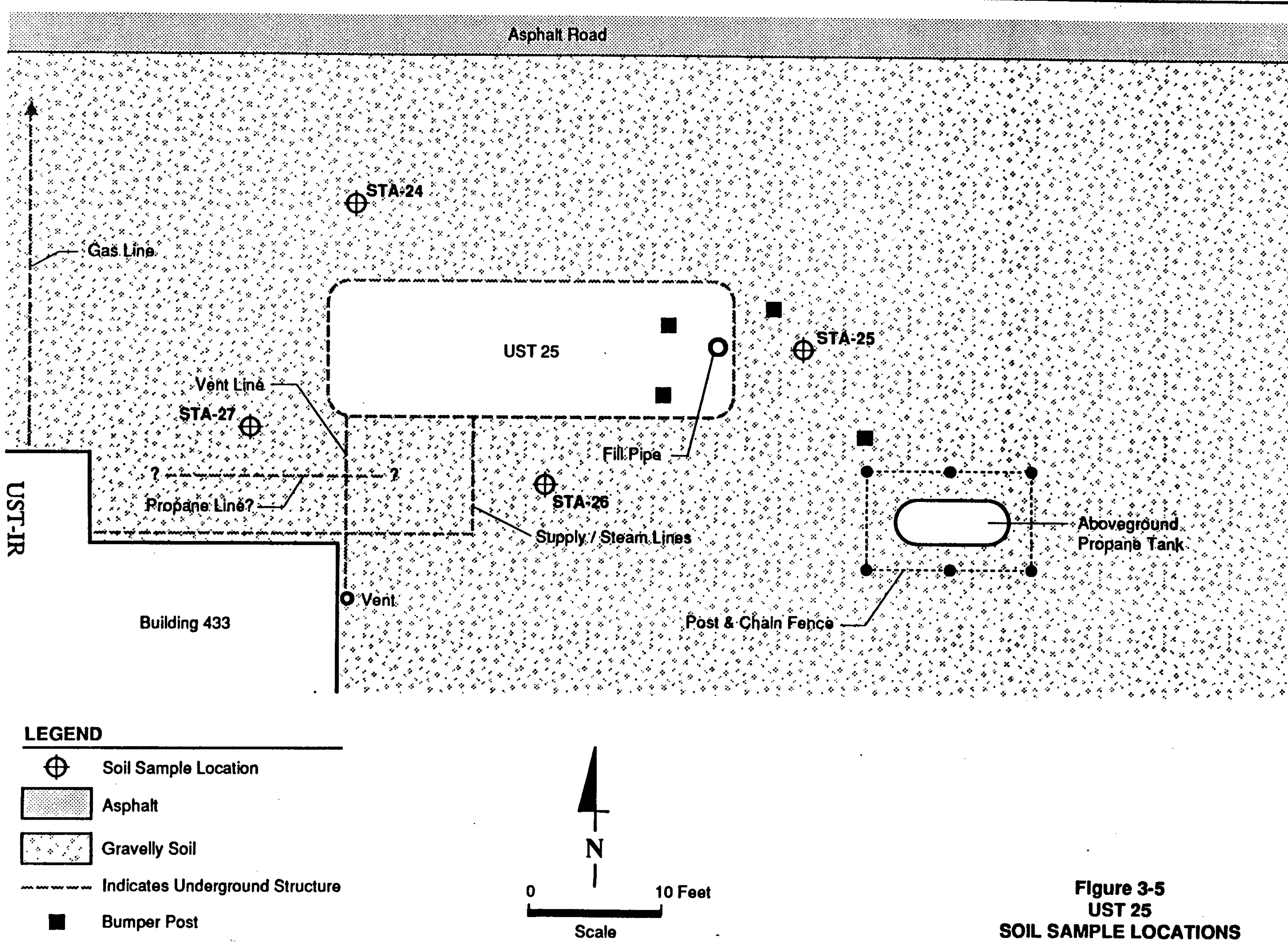


Figure 3-5
UST 25
SOIL SAMPLE LOCATIONS

DAMES & MOORE

3.22.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 26 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.22.3 Conclusions and Recommendations

Because UST 26 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 26. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.23 UST 27

3.23.1 Tank Description and Investigation

UST 27 is an active diesel fuel tank with an estimated capacity of 675 gallons. The tank is located at the northeast corner of Building 15 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.23.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 27 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.23.3 Conclusions and Recommendations

Because UST 27 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 27. However, because U.S. Army regulations require all USTs to be treated as regulated

tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.24 UST 28

3.24.1 Tank Description and Investigation

UST 28 is an active diesel fuel tank with an estimated capacity of 675 gallons. The tank is located at the northwest corner of Building 16 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.24.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 28 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.24.3 Conclusions and Recommendations

Because UST 28 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 28. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.25 UST 29

3.25.1 Tank Description and Investigation

UST 29 is an active diesel fuel tank with an estimated capacity of 675 gallons. The tank is located at the northeast corner of Building 16 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.25.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 29 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.25.3 Conclusions and Recommendations

Because UST 29 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 29. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.26 UST 30

3.26.1 Tank Description and Investigation

UST 30 is an active diesel fuel tank with an estimated capacity of 375 gallons. The tank is located southeast of Building 35 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.26.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 30 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.26.3 Conclusions and Recommendations

Because UST 30 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 30. However, because U.S. Army regulations require all USTs to be treated as regulated

tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.27 UST 31

3.27.1 Tank Description and Investigation

UST 31 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located south of Building 55 in the Administration Area (see Plate 1). Tank leak testing was conducted to evaluate tank integrity.

3.27.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 31 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.27.3 Conclusions and Recommendations

Because UST 31 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 31. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.28 UST 32

3.28.1 Tank Description and Investigation

UST 32 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located in the central portion of Area II (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.28.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 32 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.28.3 Conclusions and Recommendations

Because UST 32 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 32. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.29 UST 33

3.29.1 Tank Description and Investigation

UST 33 is an active diesel fuel tank with an estimated capacity of 1,000 gallons. The tank is located in the central portion of Area II (see Plate 2). Tank leak testing was conducted to evaluate tank integrity.

3.29.2 Contamination Assessment

Tank leak test results are shown in Table 3-2. The results indicate that UST 33 is certified to meet the State of Oregon definition of a tight tank and pipeline delivery system, and that contamination of the surrounding soil is not expected to be a concern.

3.29.3 Conclusions and Recommendations

Because UST 33 passed the tank leak test, the potential for stored fuel from this tank to leak to the surrounding soil is expected to be low and is not considered to be a concern. Therefore, no immediate action is recommended for UST 33. However, because U.S. Army regulations require all USTs to be treated as regulated

tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tank system and to identify potential leaks.

3.30 UST 64

3.30.1 Tank Description and Investigation

The contents and location of UST 64 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 64 was described as a 900-gallon diesel fuel tank located in the northwest corner of the Administration Area near the intersection of Fir and D Streets (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within an 80- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

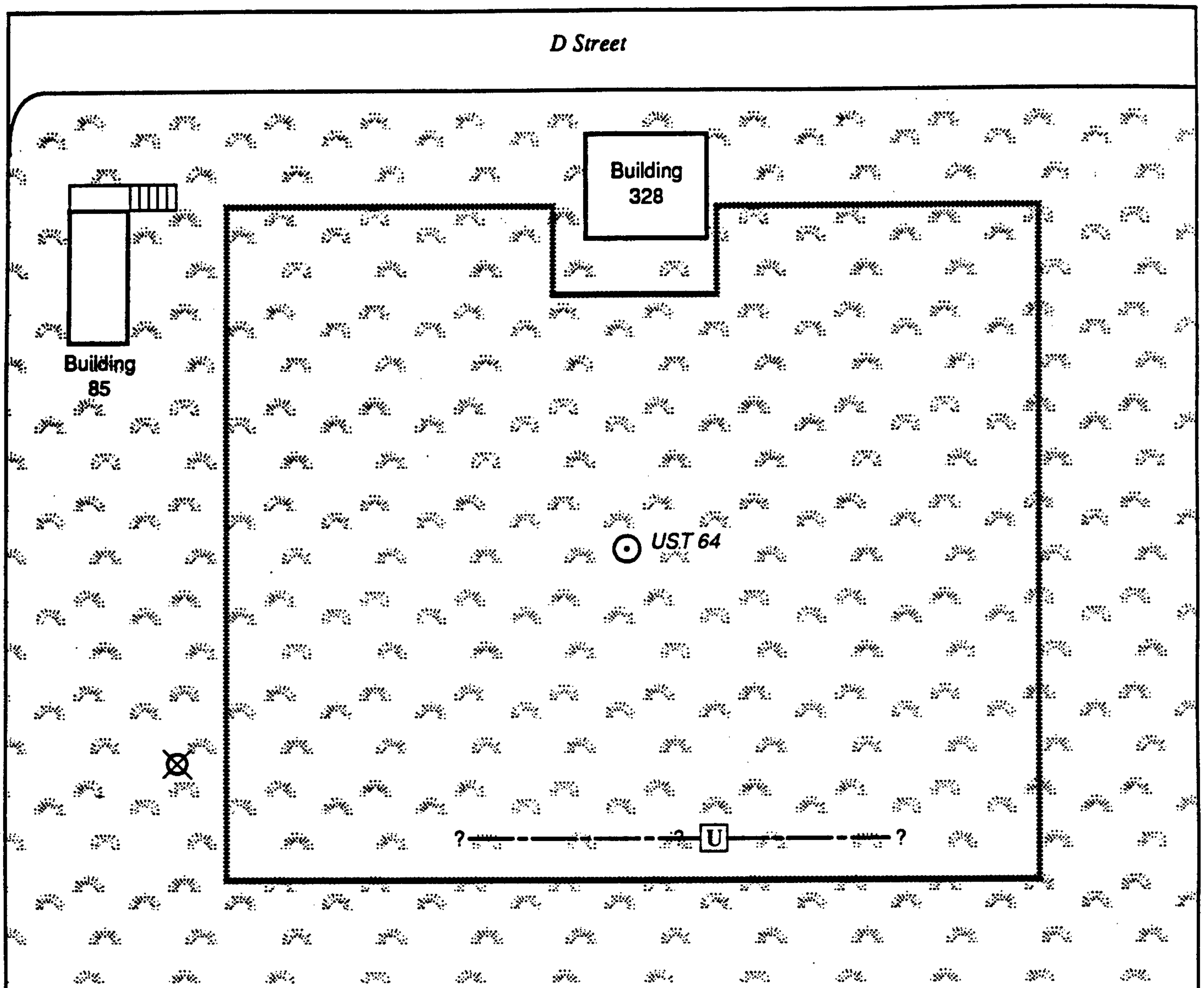
After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 20 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 64. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.30.2 Contamination Assessment.

Figure 3-6 shows the reported location of UST 64 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that an UST is present within the surveyed area. Several magnetic and conductivity anomalies observed at the site were not characteristic of an UST and appear to be associated with underground utilities (i.e., possible abandoned water lines and a utility vault) or interference from Building 328, a small abandoned building placed on skids and stored near the former location of Building 84, which was moved behind the Services Branch Building. Magnetic interference prohibited the collection of data near the building. It is unknown whether the UST is or may have been located directly below Building 328, though this is considered to be unlikely.

Figure 3-7 presents the active soil gas results for the BTEX and TVHC components of the survey conducted at UST 64. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 20 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in nine samples, with concentrations ranging from 0.06 (which is slightly greater than the detection limit of 0.04 microgram per liter (μg/L)) to a maximum of 0.5 μg/L. Toluene was detected at five locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is slightly greater than the detection limit of 0.05 μg/L) to a maximum of 0.5 μg/L. TVHCs were reported at six of the locations, with concentrations ranging from 0.4 (which is slightly greater than the detection limit of 0.3 μg/L) to a maximum of 3 μg/L.

Although detectable concentrations of volatiles were noted in the immediate vicinity of the reported location of UST 64, they are very low and are not considered to indicate significant, if any, contamination. Concentrations of all analytes were slightly greater to the south of the reported UST location, but these and other volatiles concentrations do not exhibit a consistent or contiguous pattern typical of



LEGEND

Perimeter of Geophysical Survey

Dry Well

Grass and Low Brush

Utility Vault

Abandoned Water Lines (Uncertain)

Reported UST Location
UST # in Italics (Work Plan)

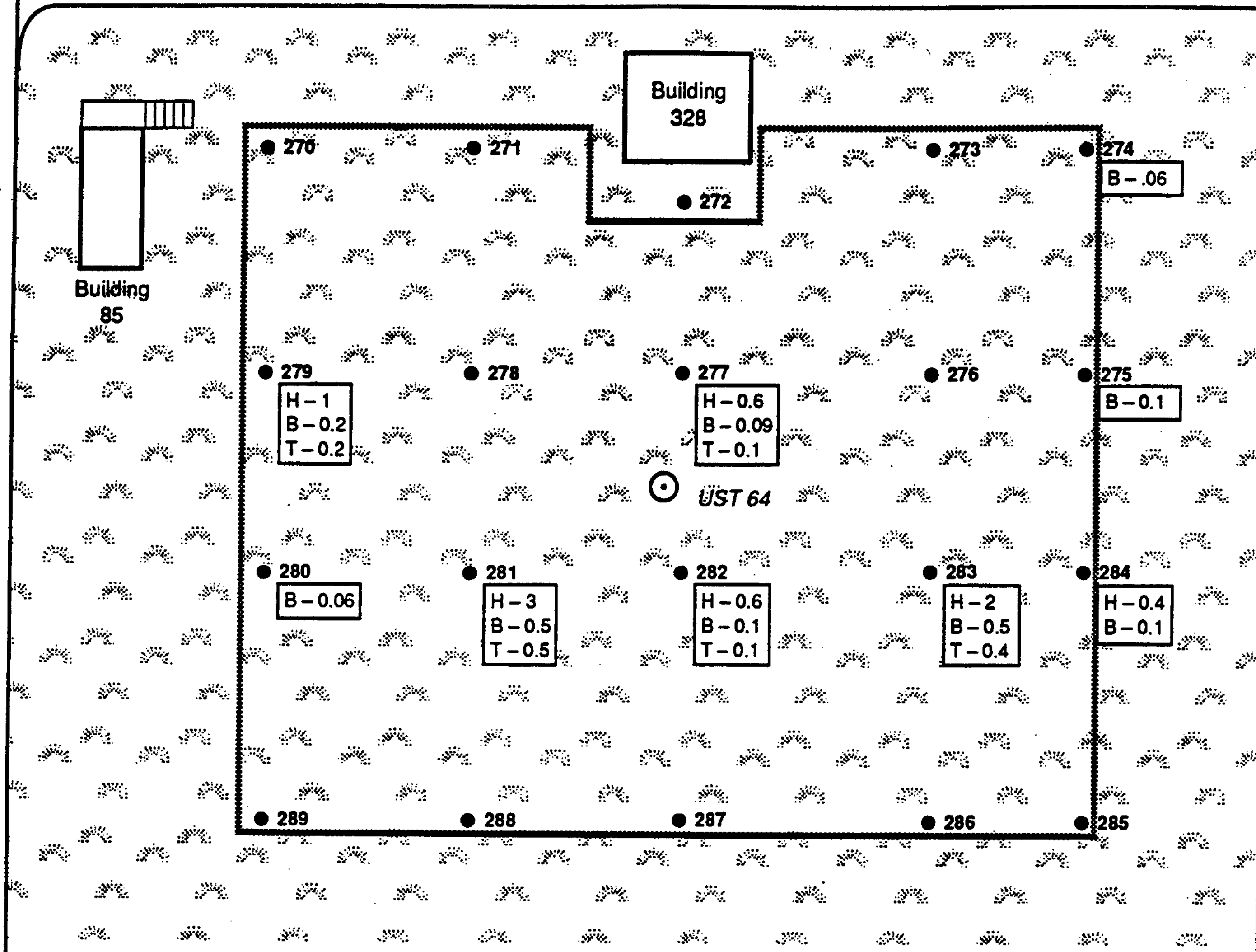
N

0 20 Feet

Scale

Figure 3-6
UST 64
RESULTS OF GEOPHYSICAL SURVEY

DAMES & MOORE



LEGEND

Perimeter of Geophysical Survey

Grass and Low Brush

Reported UST Location
UST # in Italics (Work Plan)

● 281 Sampling Probe Location and Number

H – <0.3	TVHC Sample Value (µg/L)
B – <0.04	Benzene Sample Value (µg/L)
T – <0.09	Toluene Sample Value (µg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

N

0 20 Feet
Scale

Figure 3-7
UST 64
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor tank leakage, if the UST existed, or localized surface spillage due to vehicular traffic, UST servicing, or former building operations.

Carbon dioxide was reported at 15 of the locations, with concentrations ranging from 800 (which is slightly greater than the detection limit of 640 $\mu g/L$) to a maximum of 3,400 $\mu g/L$ (Appendix D). Although a slightly elevated level of carbon dioxide (3,400 $\mu g/L$) at SG-283 is associated with near maximum levels of volatiles detected at this site, the remaining carbon dioxide levels do not correlate well with other volatiles responses; nor do they indicate levels in excess of background concentrations, as commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 1,300 $\mu g/L$, was not detected at the site.

3.30.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 8,000 square feet, indicate that an UST is unlikely to be present in the area reported to contain UST 64. However, data from the geophysical survey do not indicate whether UST 64 had been there previously and was removed.

The chemical results of 20 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, and TVHCs--at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank was present--it did not leak sufficient quantities (if at all) to affect the environment.

No further action is recommended at this site because of these geophysical survey and soil gas survey results.

3.31 UST 65

3.31.1 Tank Description and Investigation

The contents and location of UST 65 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 65 was described as an 800-gallon diesel fuel tank located in the northwest portion of the Administration Area, north of D Street, slightly west of USTs 42 and 43, and within the boundaries of Site 73, Diesel Fuel Spill Location (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 95- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area as part of the investigation of Site 73, Diesel Fuel Spill Location, which included an extended soil gas sampling area. The purpose of the survey was to evaluate potential source areas of volatiles soil contamination related to the spill in the event that the tank had leaked but had been removed. A total of 57 active soil gas samples were collected in a rectangular grid around the reported location of UST 65 and the reported diesel spill. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.31.2 Contamination Assessment

Figure 3-8 shows the reported location of UST 65 and summarizes the results of the geophysical survey. Data and contour maps are presented in Appendix C. The results of the survey indicate that it is unlikely that an UST is or may have been located within the surveyed area. Several weak-to-moderate magnetic and conductivity anomalies observed west of the fence were not characteristic of an UST and appear to be associated with underground utilities and the fence. A small asphalt patch located in the southeast corner of the survey area may be the former location of an UST; however, results of the geophysical survey, though affected by the fence near the patch, do not support this.

Because the UST 65 soil gas investigation was conducted as part of the diesel fuel spill investigation, soil gas results are presented with the Site 73 results (see Section 3.52.2).

3.31.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 9,500 square feet, indicate that an UST is unlikely to be present in the area reported to contain UST 65. Although a small asphalt patch located in the southeast corner of the survey area may be the former location of an UST, data from the geophysical survey--though affected by the fence near the patch--do not indicate whether UST 65 had been here previously and was removed.

Because the UST 65 active soil gas investigation was conducted as part of the Site 73 investigation, further conclusions and recommendations are presented in Section 3.52.3.

3.32 USTs 76 and 77

3.32.1 Tank Description and Investigation

The contents and locations of USTs 76 and 77 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA

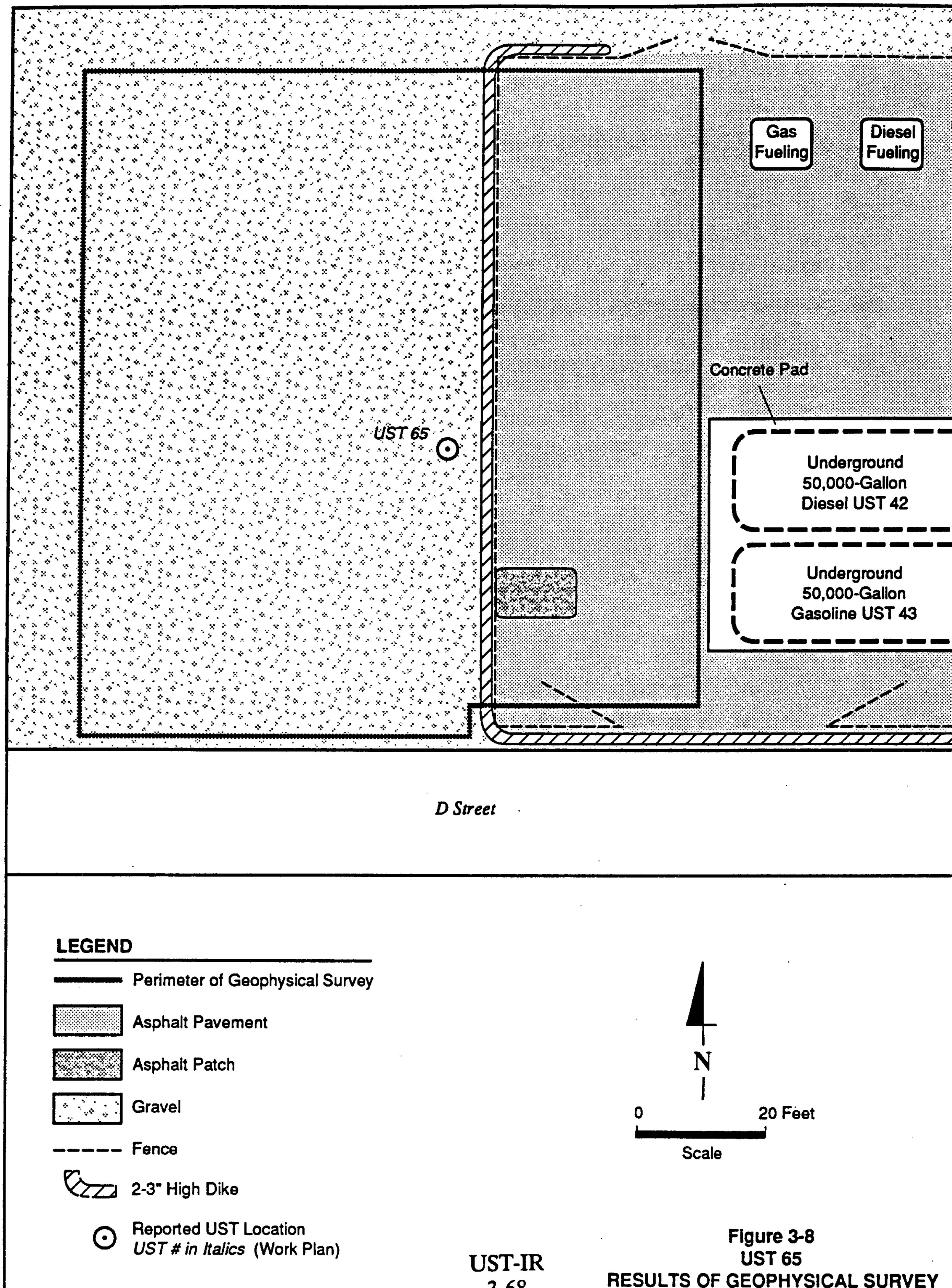


Figure 3-8
UST 65
RESULTS OF GEOPHYSICAL SURVEY

(Dames & Moore, 1990a). These USTs were described as a 600-gallon diesel fuel tank and an 800-gallon light oil tank, respectively, located in the southwest corner of the Administration Area, south of South Street, in what is presently a horse pasture (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of present or former tanks--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tanks existed and were removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tanks in the event that they were abandoned and remained underground at the site. The survey was conducted around the reported UST locations within a 120- by 200-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tanks (if they existed) had leaked but had been removed. A total of 40 active soil gas samples were collected in a 25-foot rectangular grid around the reported locations of the tanks. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.32.2 Contamination Assessment

Figure 3-9 shows the reported locations of USTs 76 and 77 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the geophysical survey indicate that it is unlikely that USTs are present within the surveyed area. Several magnetic and conductivity anomalies observed at the site were not characteristic of USTs and appear to be associated with underground utilities, such as a water line with

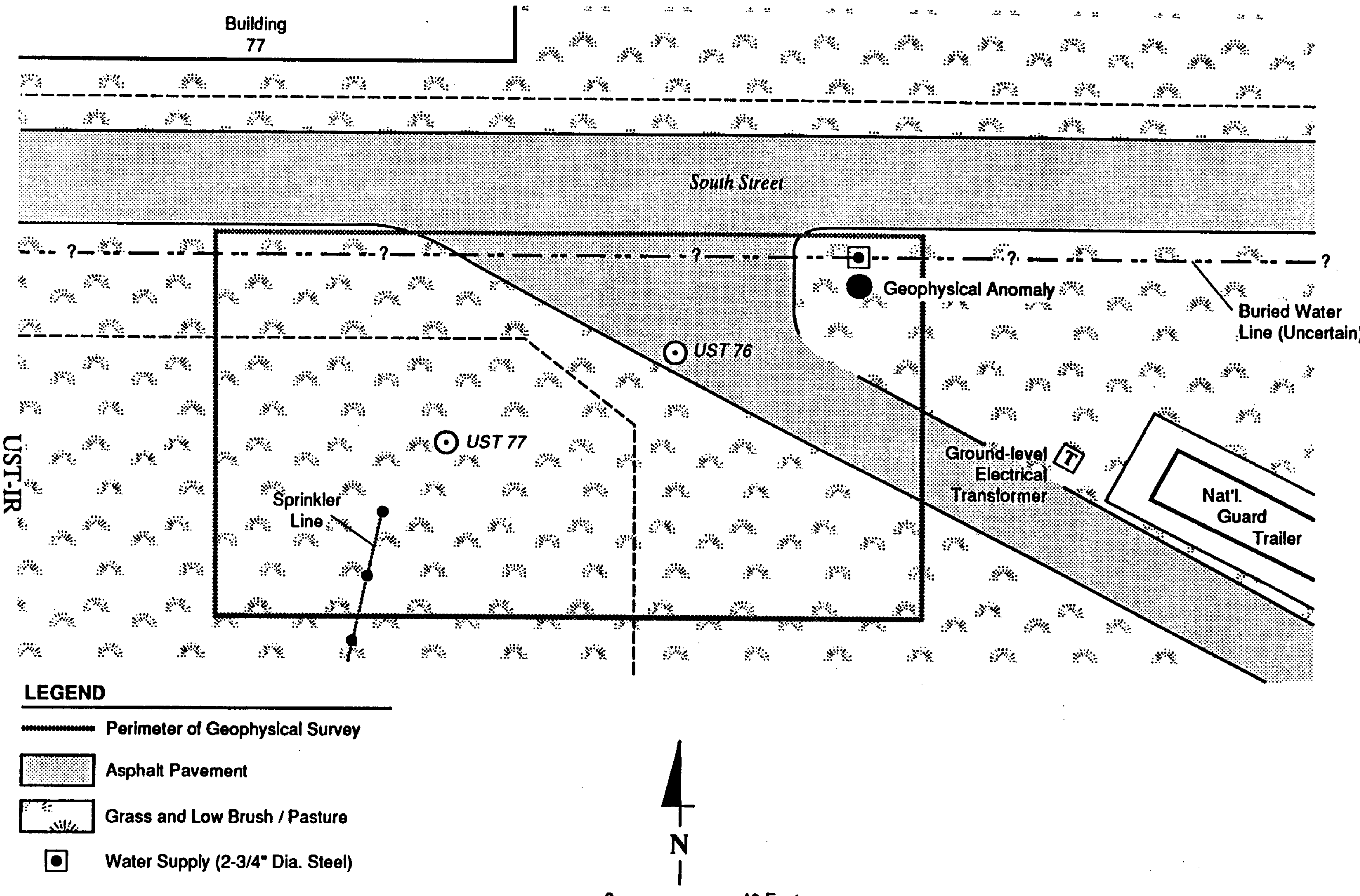


Figure 3-9
UST 76 & 77
RESULTS OF GEOPHYSICAL SURVEY

an aboveground sprinkler head (in the southwest corner of the survey area) and a water supply line (in the northwest corner). A strong rectangular magnetic and EM anomaly was detected in the northeast corner of the survey area, less than 5 feet from a 4-foot steel water supply pipe. Although the exact nature of this anomaly is unknown, it is likely associated with the water supply pipe.

Figure 3-10 presents results for the BTEX and TVHC components of the active soil gas survey conducted at USTs 76 and 77. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, ethylbenzene, and TVHCs at some of the 40 sampled locations. Xylene was not detected at this site. Benzene was detected in 19 samples, with concentrations ranging from 0.05 (which is slightly greater than the detection limit of 0.02 μg/L) to a maximum of 1 μg/L. Toluene was detected at 14 locations coincident with benzene detections; it was reported at concentrations ranging from 0.08 (which is slightly greater than the detection limit of 0.04 μg/L) to a maximum of 1 μg/L. Ethylbenzene was reported at one location, with a concentration of 0.5 μg/L, which is slightly greater than the detection limit of 0.1 μg/L. TVHCs were reported at 16 of the locations, with concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.1 μg/L) to a maximum of 6 μg/L.

Although detectable concentrations of volatiles were noted in the immediate vicinity of the reported location of UST 76, the concentrations are very low and are not considered to indicate significant, if any, contamination. Concentrations of all analytes were slightly greater at and near the asphalt road, but these and other volatiles concentrations do not exhibit a consistent or contiguous pattern typical of point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor tank leakage, if the UST existed. The results also may reflect the inadvertent introduction of volatile asphalt constituents into the soil gas samples collected below the roadway, or localized surface

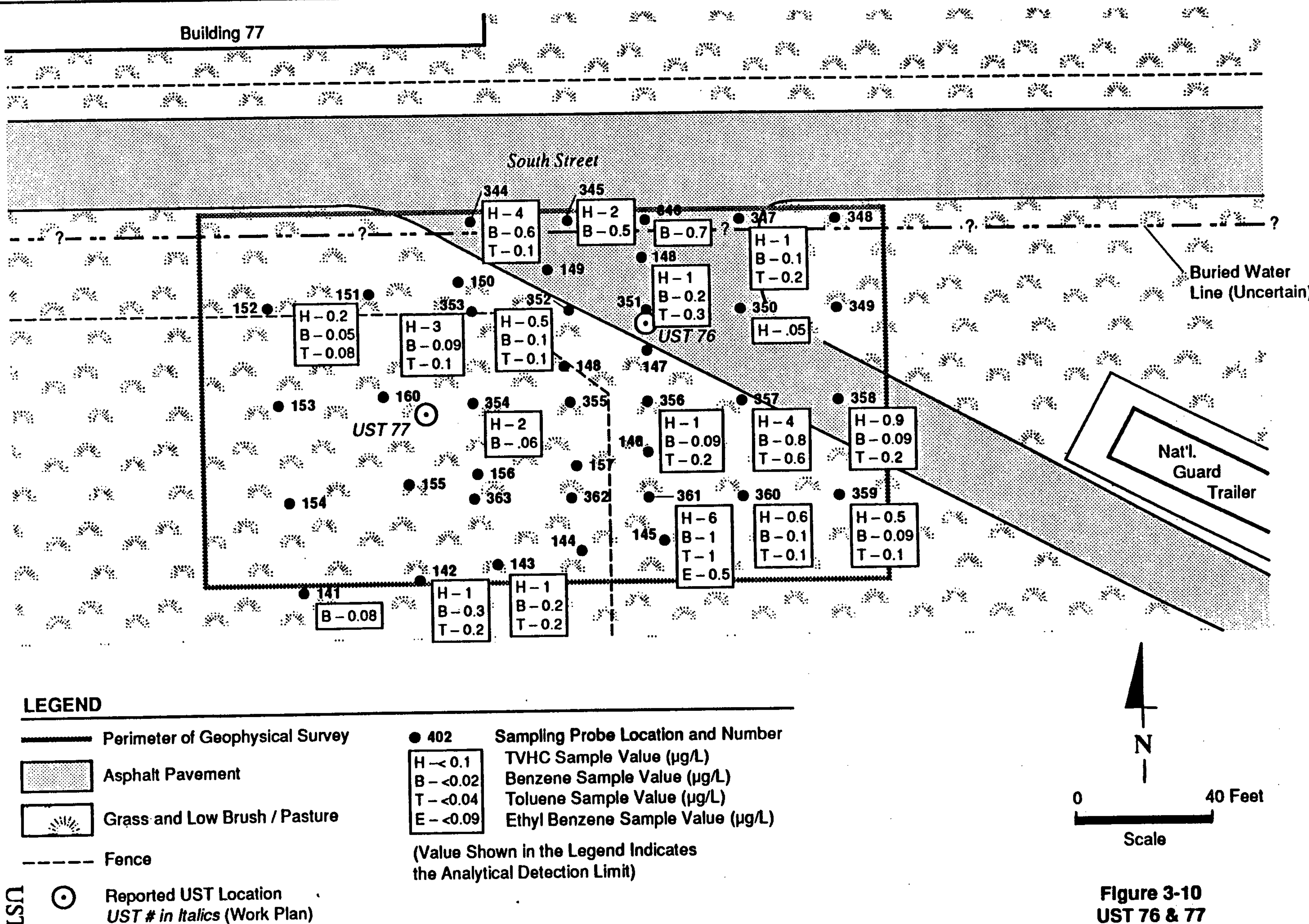


Figure 3-10
UST 76 & 77
RESULTS OF SOIL GAS SURVEY

spillage due to vehicular traffic or to the application and disposal of oil in this area (see Site 44, Road Oil Application/Disposal Site II; Dames & Moore, 1992b).

Carbon dioxide was reported at all locations, with concentrations ranging from 610 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 12,000 $\mu g/L$ (Appendix D). Although an elevated level of carbon dioxide (12,000 $\mu g/L$) at SG-148 is associated with detectable levels of volatiles, the remaining carbon dioxide levels do not correlate well with other volatiles responses and indicate only a few discrete locations in excess of background concentrations, as commonly reported for soil gas samples with no detectable volatiles. Methane, with a minimum detection limit of 730 $\mu g/L$, was not detected at the site.

3.32.3 Conclusions and Recommendations

The results of the UST 76 and 77 geophysical survey, which covered approximately 24,000 square feet, indicate that USTs are unlikely to be present in this area. Although one unidentified anomaly was detected during the survey, it appears to be associated with water supply lines in the area. Data from the geophysical survey do not indicate whether the USTs had been here and were removed.

The chemical results of 40 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, ethylbenzene, and TVHCs, at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if tanks were present--they did not leak sufficient quantities (if at all) to affect the environment.

No further action is recommended at this site because of the results from the geophysical survey and the soil gas survey.

3.33 UST 79

3.33.1 Tank Description and Investigation

The contents and location of UST 79 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore,

1990a). UST 79 was described as a 1,000-gallon bunker fuel tank located adjacent to Building 54 in the south-central portion of the Administration Area (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 45- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 16 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 79. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.33.2 Contamination Assessment

Figure 3-11 shows the reported location of UST 79 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that several small anomalies were detected in the surveyed area--all but one of which appear to be associated with utilities or interferences from Building 54. One strong geophysical anomaly, observed in both the vertical magnetic gradient and EM data, was detected near the reported UST location adjacent to the building. Although the

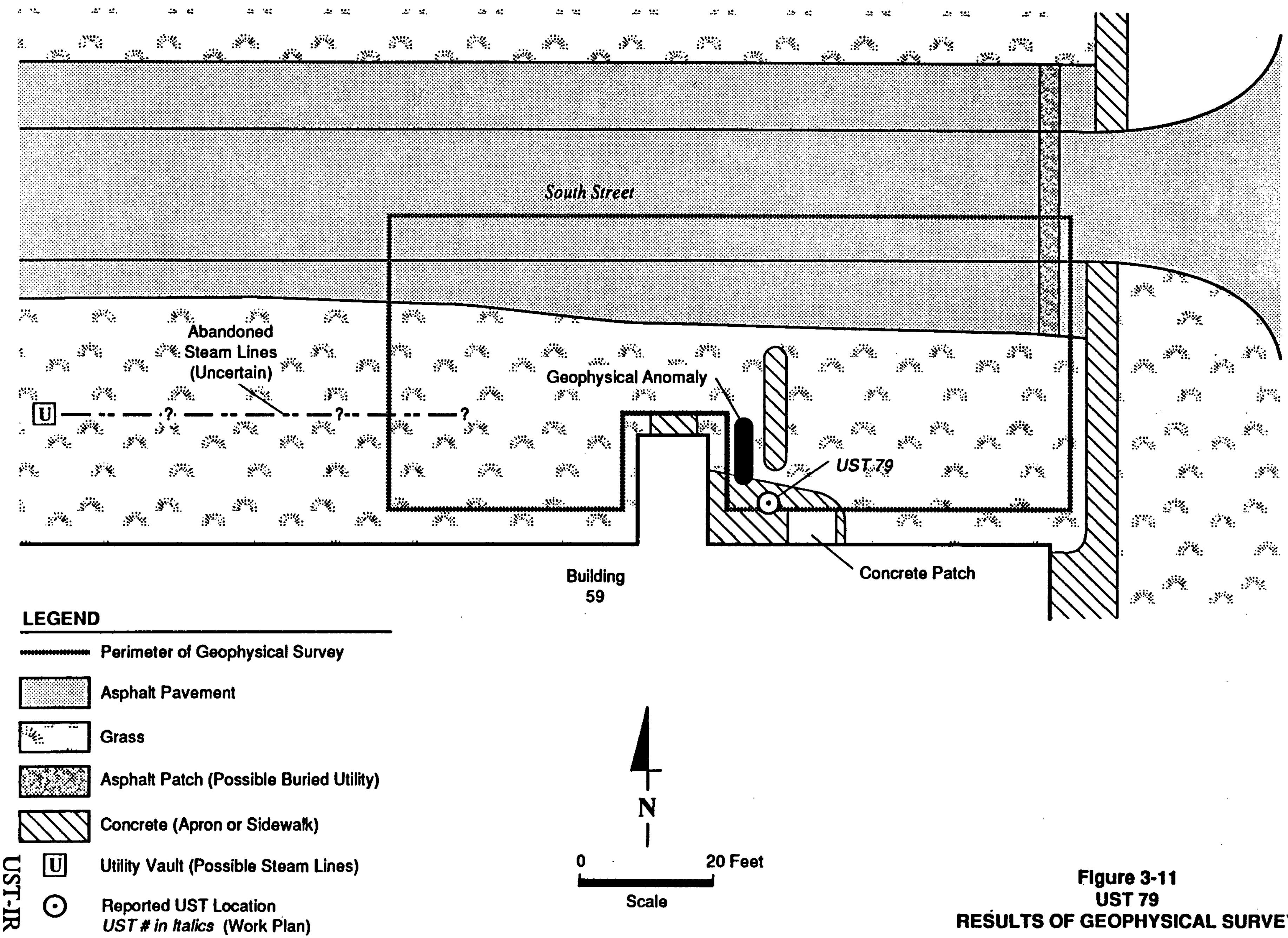


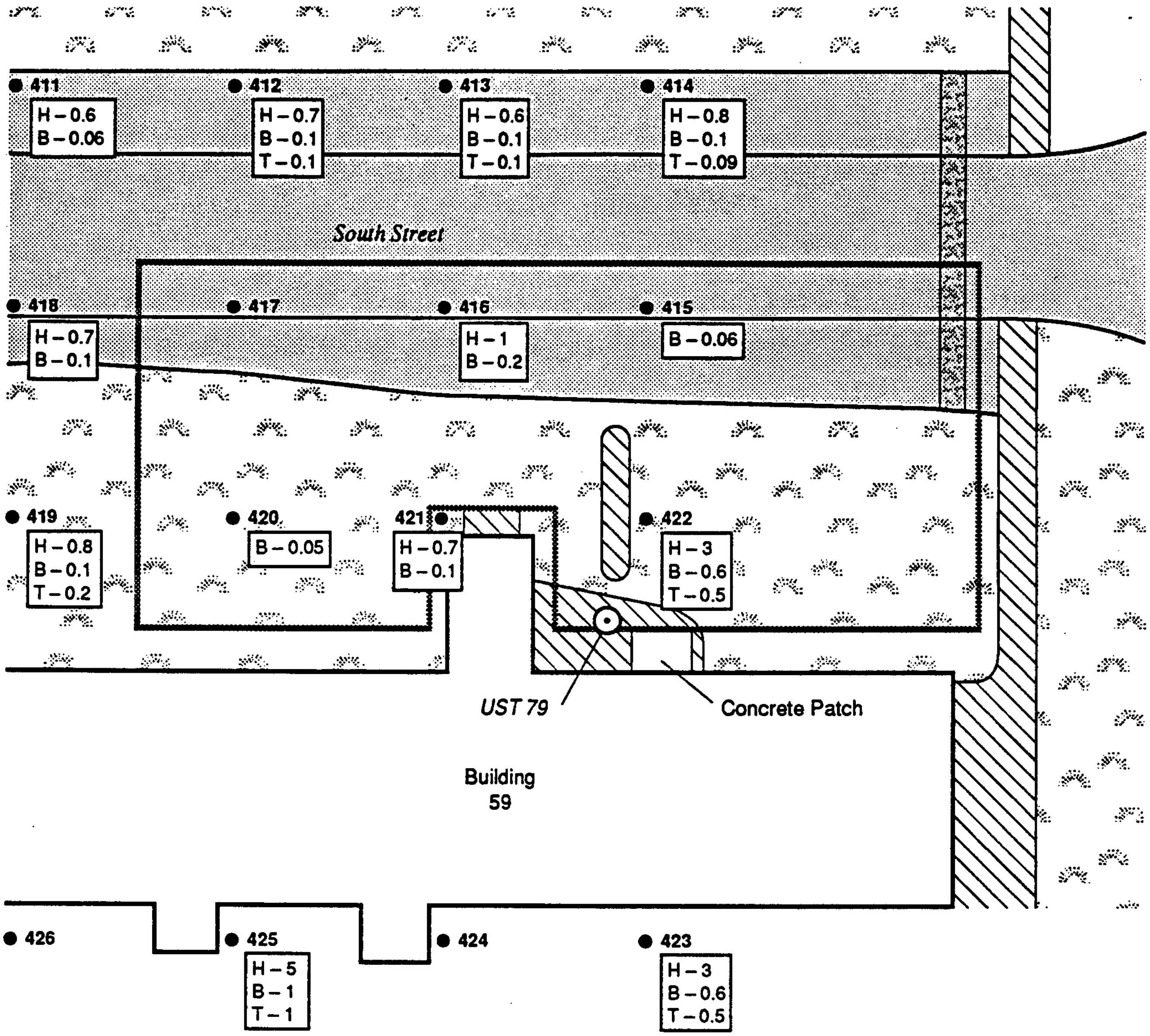
Figure 3-11
UST 79
RESULTS OF GEOPHYSICAL SURVEY

anomaly may reflect interference from the building, it should be considered a possible target. It is unknown whether the anomaly indicates the presence of a fuel tank, steam tank, or utility vault.

Figure 3-12 presents the results for the BTEX and TVHC components of the active soil gas survey conducted at UST 79. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 16 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in 13 samples, with concentrations ranging from 0.05 (which is slightly greater than the detection limit of 0.04 μg/L) to a maximum of 1 μg/L. Toluene was detected at seven locations coincident with benzene detections; it was reported at concentrations ranging from 0.09 (which is at the detection limit of 0.09 μg/L) to a maximum of 1 μg/L. TVHCs were reported at 11 of the 16 locations, with concentrations ranging from 0.6 (which is slightly greater than the detection limit of 0.4 μg/L) to a maximum of 5 μg/L.

Although detectable concentrations of volatiles were noted in the immediate vicinity of the reported location of UST 79, the concentrations are very low and are not considered to indicate significant, if any, contamination. Concentrations of all analytes were slightly greater near Building 54 and the reported UST location, with more consistent concentrations at the roadway, but these and other volatiles concentrations do not exhibit a consistent or contiguous pattern typical of point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor tank leakage if the UST existed (or exists). The results may also reflect the inadvertent introduction of asphalt constituents into the soil gas samples collected below the roadway or localized surface spillage near the building.

Carbon dioxide was reported at all locations, with concentrations ranging from 670 (which is slightly greater than the detection limit of 310 μg/L) to a maximum of 2,700 μg/L (Appendix D). Although slightly elevated levels of carbon dioxide



LEGEND

- Perimeter of Geophysical Survey
- Asphalt Pavement
- Grass
- Asphalt Patch (Possible Buried Utility)
- Concrete (Apron or Sidewalk)
- Reported UST Location
  UST # in Italics (Work Plan)
- ● 423 Sampling Probe Location and Number
  - H – <0.4 TVHC Sample Value (µg/L)
  - B – <0.04 Benzene Sample Value (µg/L)
  - T – <0.09 Toluene Sample Value (µg/L)

(Value Shown in Legend Indicates the Analytical Detection Limit)

N

0 20 Feet

Scale

Figure 3-12
UST 79
RESULTS OF SOIL GAS SURVEY

(2,200 μg/L and 1,800 μg/L) at SG-422 and SG-425 are associated with the near maximum and maximum levels of volatiles detected at this site, the remaining carbon dioxide levels do not correlate well with other volatiles responses; nor do they indicate levels in excess of concentrations commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 840 μg/L, was not detected at the site.

3.33.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 4,500 square feet, indicate that a tank or utility vault may be present adjacent to Building 54 and near the location reported to contain UST 79. However, it is unknown whether the geophysical anomaly was due to the presence of a buried structure or to interference from the building.

The chemical results of 16 active soil gas samples collected at the reported site indicate that only trace concentrations of benzene, toluene, and TVHCs were detected in soil gas at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank is present or was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Although the geophysical survey indicates that a geophysical target (tank or vault) is possibly present near the building, the soil gas survey indicates limited and trace levels of soil contamination. Therefore, no further sampling is recommended at this site. However, the area of the geophysical anomaly should be excavated by UMDA; if an abandoned UST is discovered, it should be placed under the UMDA tank closure program. The tank should be removed and the surrounding soil tested and removed, if necessary, according to State tank closure procedures.

3.34 UST 80

3.34.1 Tank Description and Investigation

The contents and location of UST 80 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 80 was described as a 1,000-gallon bunker fuel tank located adjacent to Building 53 in the south-central portion of the Administration Area (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 60- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 20 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 80. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.34.2 Contamination Assessment

Figure 3-13 shows the reported location of UST 80 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that

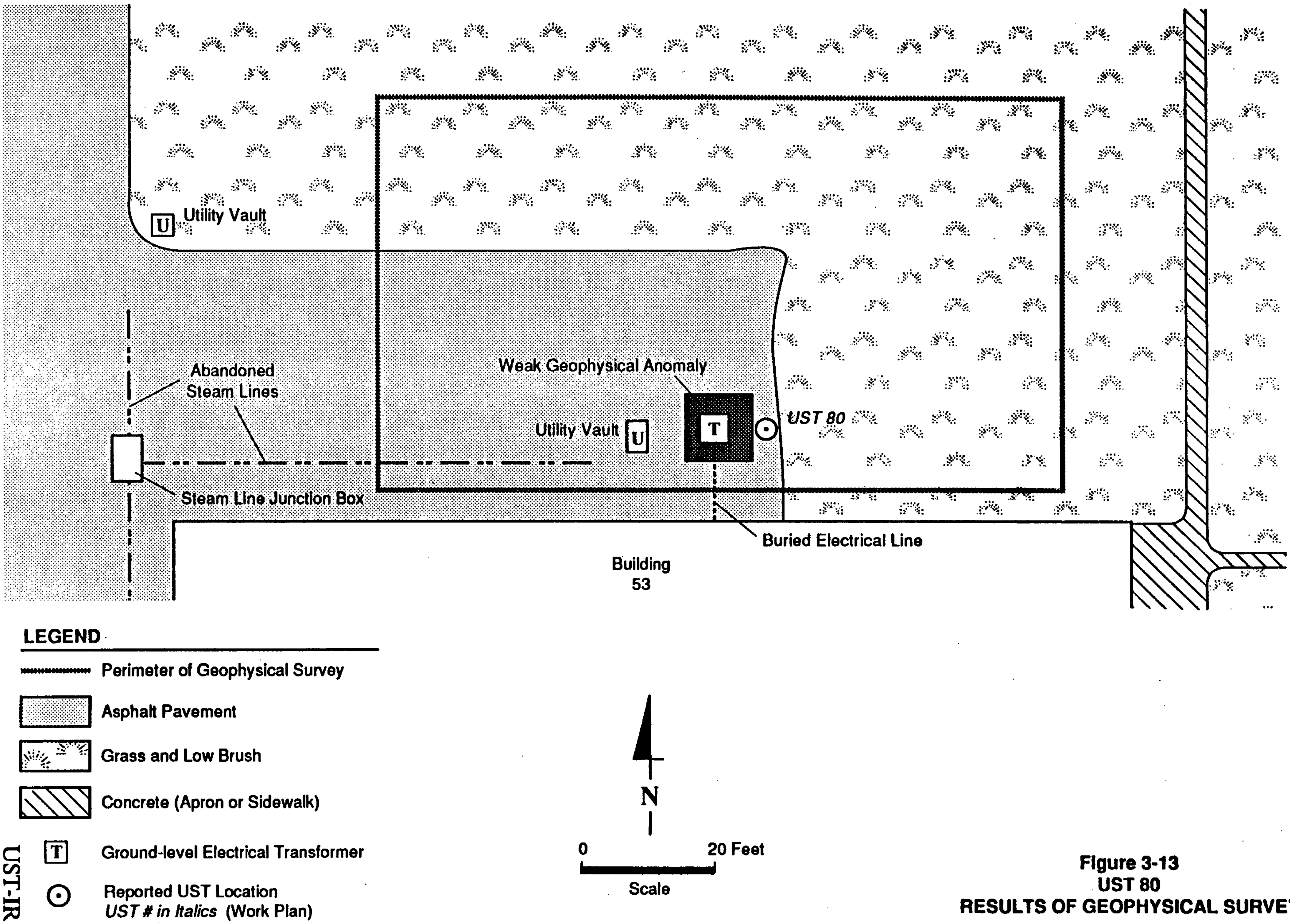


Figure 3-13
UST 80
RESULTS OF GEOPHYSICAL SURVEY

several small magnetic and EM anomalies were detected in the surveyed area. All but one of these anomalies appear to be associated with utilities or interferences from Building 53. One strong geophysical anomaly--observed in the vertical magnetic gradient, total magnetic field, and EM data--was detected near the reported UST location adjacent to Building 53. Although the anomaly may reflect interference from the building, electrical transformer, or underground utilities, it should be considered a possible target. The anomaly is in line with a steam line and a junction box to the west and is near a flush-mount utility vault and aboveground transformer housing. However, it is unknown whether the anomaly indicates the presence of a fuel tank or other structure, or is the result of interference.

Figure 3-14 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 80. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 20 sampled locations. Ethylbenzene and xylene were not detected at the site. Benzene was detected in 13 samples, with concentrations ranging from 0.04 (which is at the detection limit of 0.04 μg/L) to a maximum of 0.4 μg/L. Toluene was detected at seven locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is at the detection limit of 0.1 μg/L) to a maximum of 0.4 μg/L. TVHCs were reported at six of the locations, with concentrations ranging from 0.3 (which is at the detection limit of 0.3 μg/L) to a maximum of 2 μg/L.

Although detectable concentrations of volatiles were noted in the vicinity of the reported location of UST 80, the concentrations are very low and are not considered to indicate significant, if any, contamination. The concentrations of all analytes were greatest in one sample collected near Building 53, northeast of the reported UST. Samples with more consistent concentrations were located in the vicinity of the reported UST, but concentrations were also reported at similar levels in samples collected below the asphalt lot west of the reported UST and in soil north of this lot. The volatiles do not exhibit a consistent or contiguous pattern typical of point sources

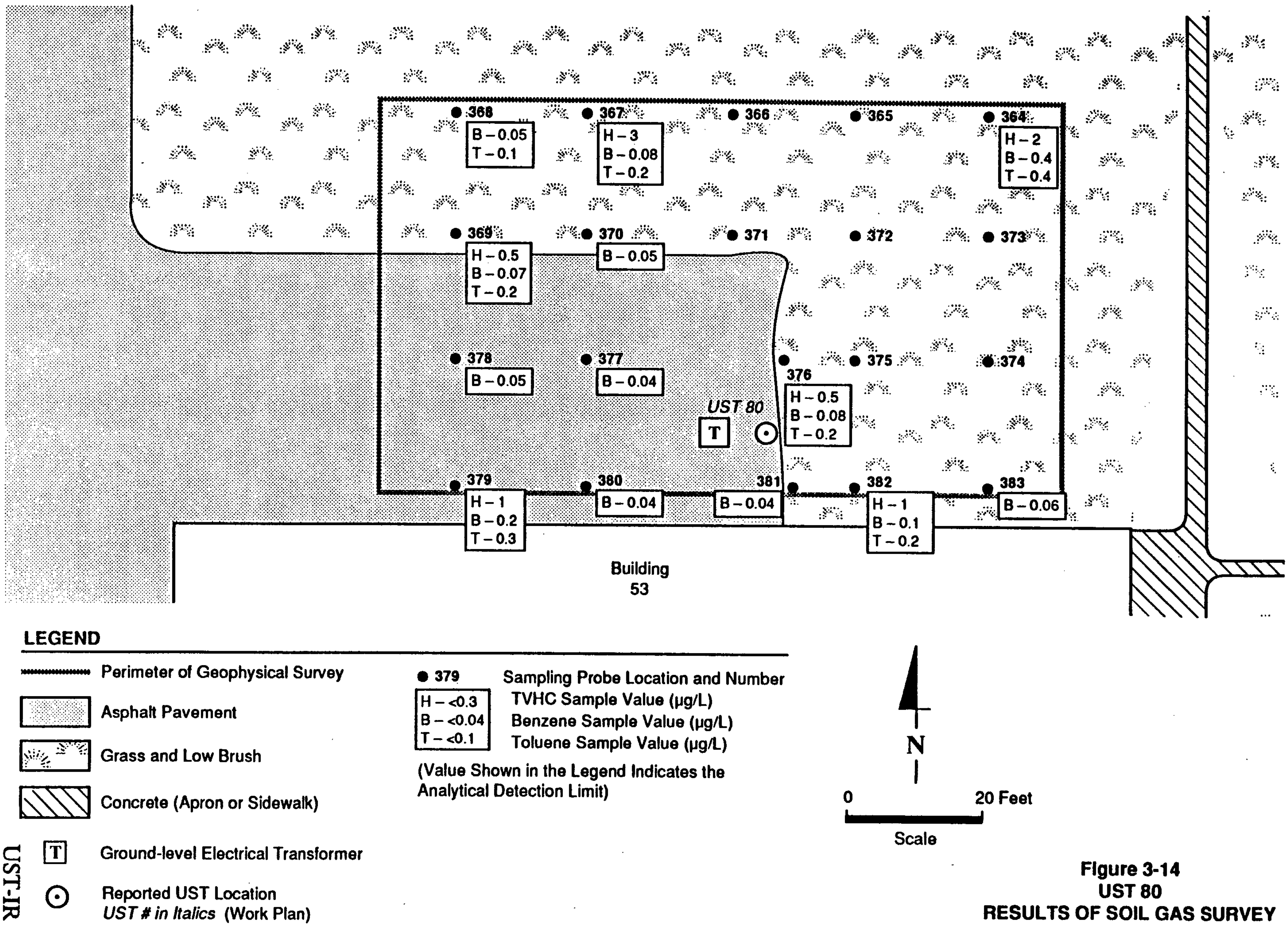


Figure 3-14
UST 80
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor tank leakage if the UST existed (or exists). The results may also reflect the inadvertent introduction of volatile asphalt constituents into the soil gas samples collected below the lot or localized surface spillage in and around the surveyed area.

Carbon dioxide was reported at all locations, with concentrations ranging from 460 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 1,300 $\mu g/L$ (Appendix D). Although the slightly elevated level of carbon dioxide (1,300 $\mu g/L$) at SG-364 is associated with the maximum level of volatiles detected at this site, the remaining carbon dioxide levels do not correlate well with other volatiles responses; nor do they indicate levels in excess of concentrations commonly reported for soil gas samples with no detectable volatiles or for ambient air (blank) samples. Methane, with a detection limit of 670 $\mu g/L$, was not detected at the site.

3.34.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 6,000 square feet, indicate that a tank or utility vault may be present adjacent to the electrical transformer housing at Building 53 and near the location reported to contain UST 80. However, it is unknown whether the geophysical anomaly was due to the presence of a structure or to interference from the building or transformer.

The chemical results of 20 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, and TVHCs at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank is present or was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Although the geophysical survey indicates that a geophysical target (tank or vault) is possibly present near the transformer housing, the soil gas survey indicates only limited and trace levels of soil contamination. Therefore, no further sampling is

recommended at this site. However, it is recommended that the area of the geophysical anomaly be excavated by UMDA; if an abandoned UST is discovered, it should be placed under the UMDA tank closure program. The tank should be removed and the surrounding soil tested and remediated, if necessary, according to State tank closure procedures.

3.35 UST 81

3.35.1 Tank Description and Investigation

The contents and location of UST 81 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 81 was described as a 1,000-gallon bunker fuel tank located adjacent to Building 52 in the south-central portion of the Administration Area (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 35- by 140-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 10 active soil gas samples were collected in a 25-foot

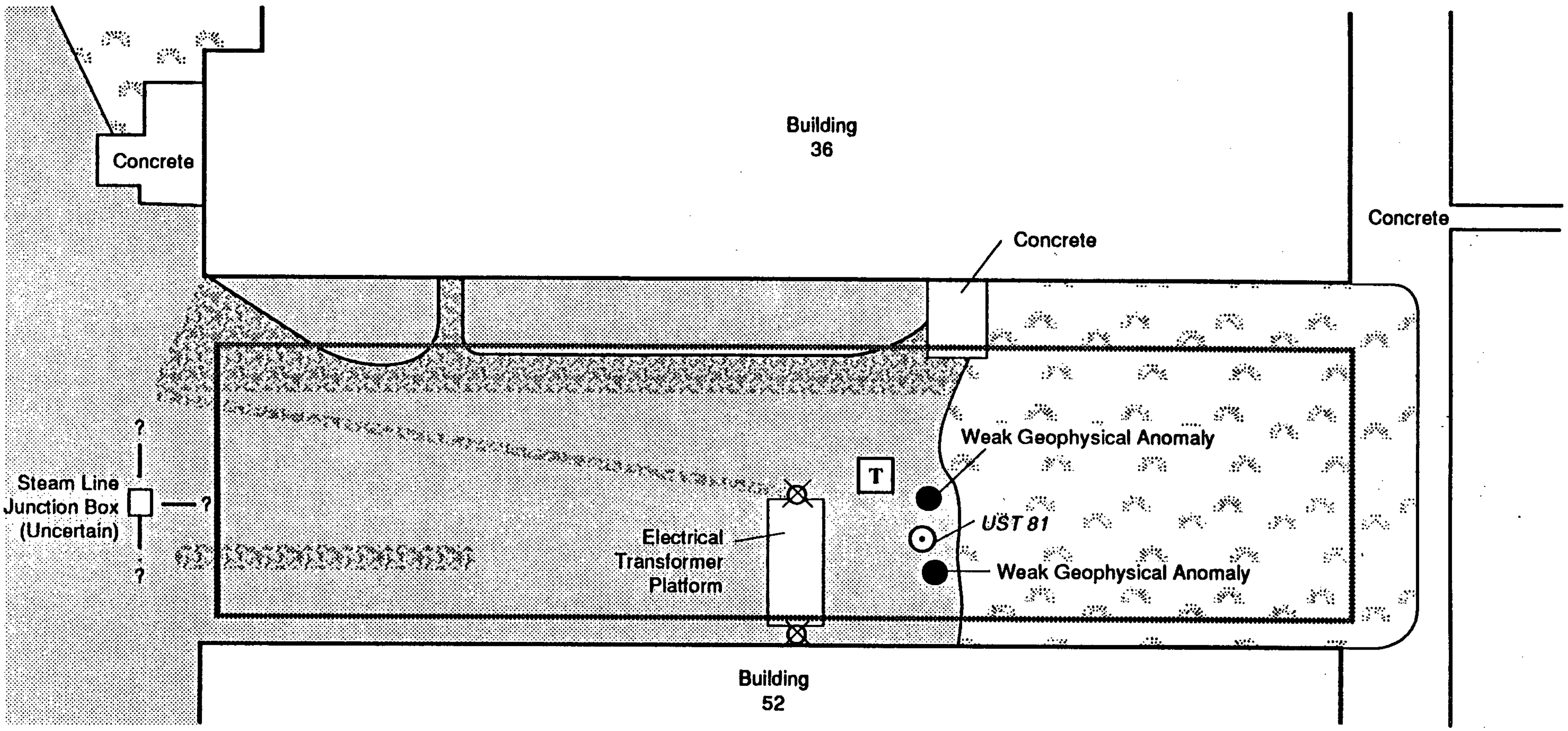
rectangular grid around the reported location of UST 81. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.35.2 Contamination Assessment

Figure 3-15 shows the reported location of UST 81 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that several small EM anomalies were detected in the surveyed area. However, large amounts of cultural interference hindered clear interpretation of the data. Anomalies in the eastern third and northwestern quarter of the site appear to be associated with utilities or interferences from Building 52. Two EM anomalies--located east of the transformer and near the reported location of UST 81--should be considered possible targets. However, because of the cultural interference encountered at the site, it is uncertain whether the anomalies are due to underground structures or to interferences from the building, transformer, or guy/anchor lines.

Figure 3-16 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 81. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at most of the 10 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in nine samples, with concentrations ranging from 0.03 (which is slightly greater than the detection limit of 0.02 μg/L) to a maximum of 0.7 μg/L. Toluene was detected at eight locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is slightly greater than the detection limit of 0.04 μg/L) to a maximum of 0.5 μg/L. TVHCs were reported at eight of the locations, with concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.1 μg/L) to a maximum of 4 μg/L.

Although detectable concentrations of volatiles were noted in the vicinity of the reported location of UST 81, the concentrations are very low and are not considered



LEGEND

- Perimeter of Geophysical Survey
- Asphalt Pavement
- Grass
- Power Poles
- Ground-level Electrical Transformer
- Asphalt Patch (May indicate buried utility or electrical lines)
- Reported UST Location – *UST # in Italics* (Work Plan)

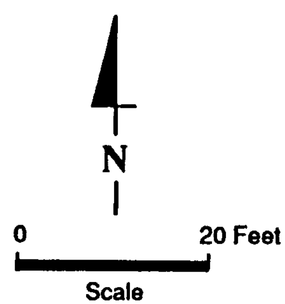


Figure 3-15
UST 81
RESULTS OF GEOPHYSICAL SURVEY

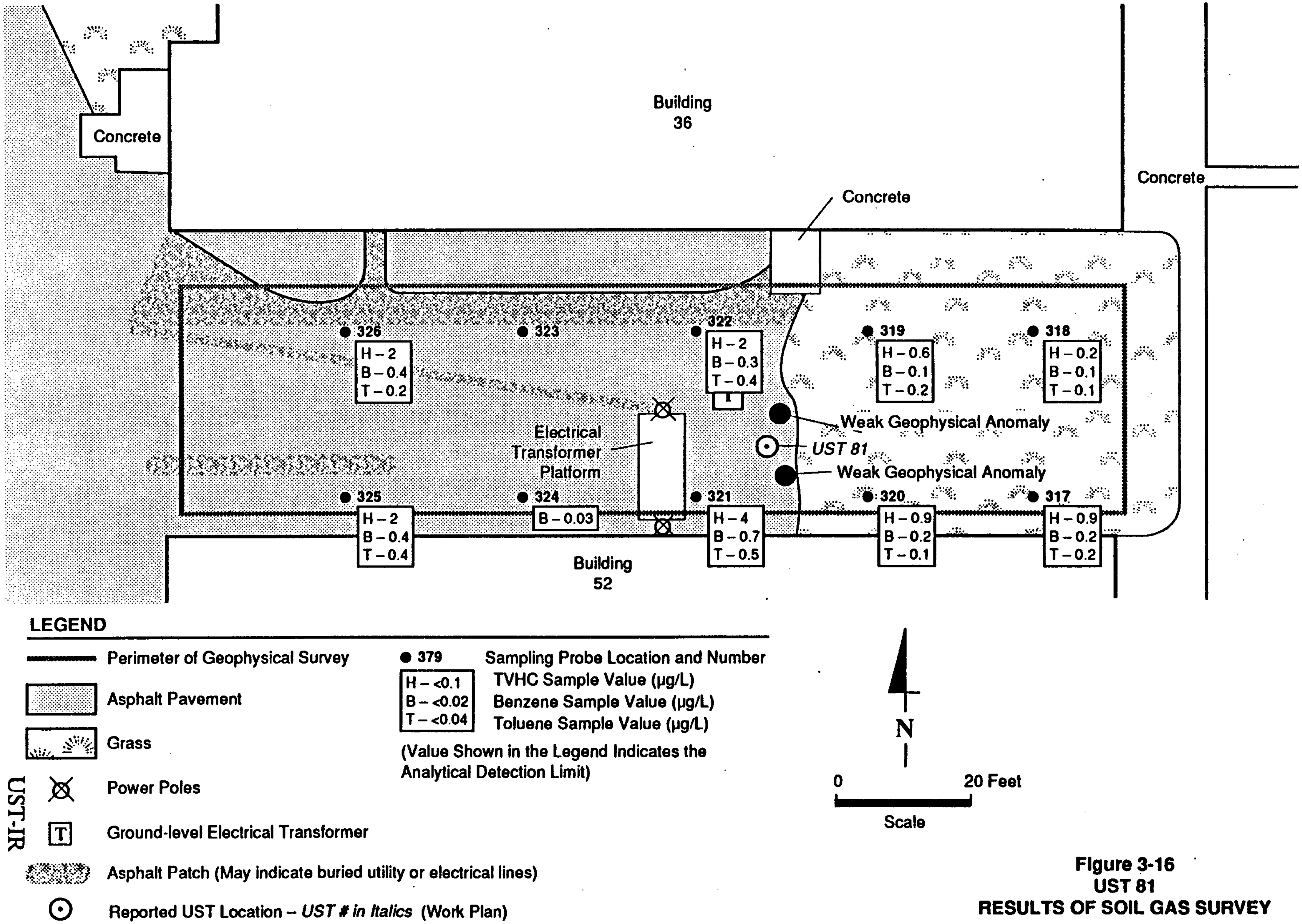


Figure 3-16
UST 81
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

to indicate significant, if any, contamination. Concentrations were greatest in samples collected near Building 52 and in samples collected underneath the asphalt lot. However, trace concentrations of volatiles--which were nearly ubiquitous at this site--do not exhibit a pattern typical of point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor tank leakage if the UST existed (or exists). The results may also reflect the inadvertent introduction of volatile asphalt constituents into the soil gas samples collected underneath the lot or localized surface spillage in and around the surveyed area.

Carbon dioxide was reported at all locations, with concentrations ranging from 690 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 2,900 $\mu g/L$ (Appendix D). Methane, with a detection limit of 730 $\mu g/L$, was not detected at the site.

3.35.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 4,900 square feet, indicate that tanks or utility vaults may be present southeast of the electrical transformer housing at Building 52 and near the location reported to contain UST 81. Because of the large amount of cultural interference at this site, it is unknown whether the geophysical anomalies are due to the presence of structures or to interference from the building, transformer, or anchor lines.

The chemical results of 10 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, and TVHCs at most locations within the area surveyed. These trace levels are not considered to be of concern, and indicate that--if a tank is present or was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Although the geophysical survey indicates that geophysical targets (tank or vault) are possibly present near the transformer housing, the soil gas survey indicates only trace levels of soil contamination. Therefore, no further sampling is

recommended at this site. However, it is recommended that the area of the geophysical anomalies be excavated by UMDA; if an abandoned UST is discovered, the tank should be placed under the UMDA tank closure program. The tank should be removed and the surrounding soil tested and remediated, if necessary, according to State tank closure procedures.

3.36 UST 82

3.36.1 Tank Description and Investigation

The contents and location of UST 82 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 82 was described as an 800-gallon bunker fuel tank located adjacent to Building 36 in the south-central portion of the Administration Area (see Plate 1). The reported location is adjacent to a former boiler room in the northwest corner of the building. (At UMDA, fuel tanks have typically been used to supply small individual boiler systems such as that in Building 36.) A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. A small asphalt patch was observed west of Building 36 during the geophysical survey. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within an 80- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 19 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 82. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.36.2 Contamination Assessment

Figure 3-17 shows the reported location of UST 82 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that several small magnetic anomalies were detected in the surveyed area. Although large amounts of cultural interference hindered clear interpretation of the data, the anomalies at the site appear to be associated with utilities or interferences from Building 36. One magnetic anomaly was observed midway between the building and a concrete pad. Because this anomaly was not observed in the EM data, it is not considered to be a target. In spite of the cultural interference and resultant effects on data interpretation, it does not appear that a target UST is present in the northern half of the survey area. Because of considerable interference, it is unknown whether a target is present in the southern half of the survey area or adjacent to Building 36.

Figure 3-18 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 82. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 19 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in 16 samples, with concentrations ranging from 0.03 (which is at the detection limit of 0.03 μg/L) to a maximum of 0.6 μg/L. Toluene was detected at 11 locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is slightly greater than the detection limit of 0.08 μg/L) to a maximum

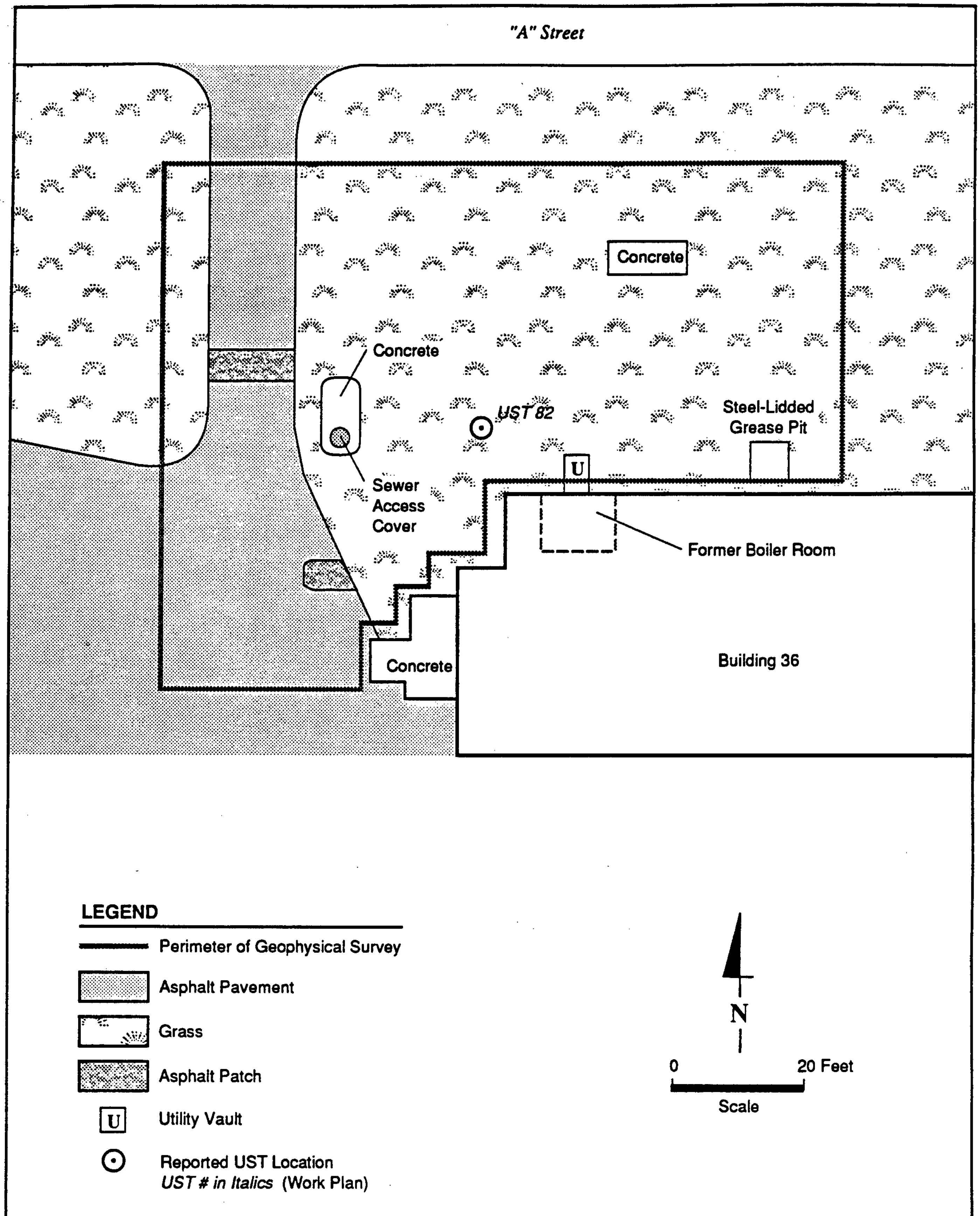


Figure 3-17
UST 82
RESULTS OF GEOPHYSICAL SURVEY

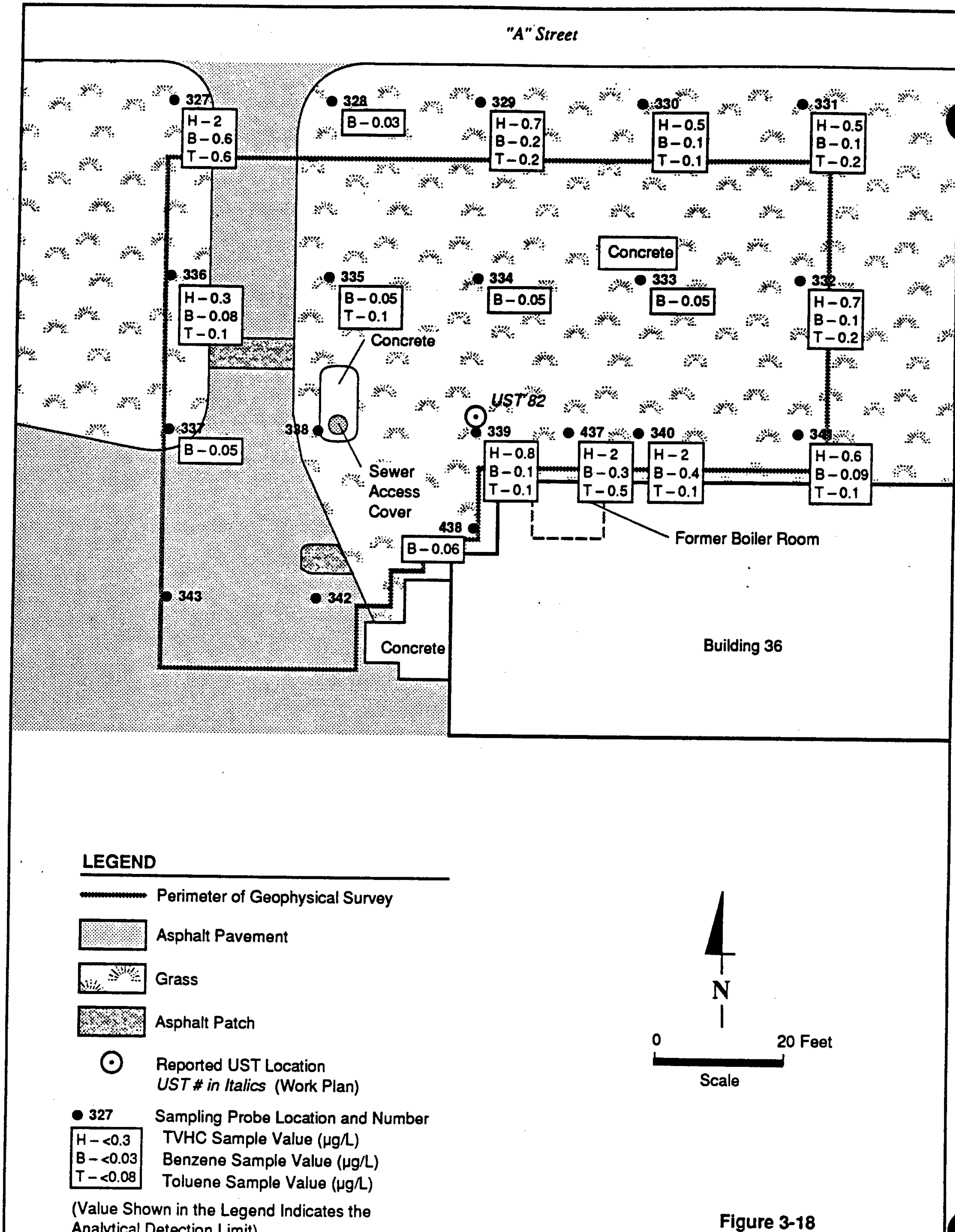


Figure 3-18
UST 82
RESULTS OF SOIL GAS SURVEY

of 0.6 $\mu g/L$. TVHCs were reported at 10 of the locations, with concentrations ranging from 0.3 (which is at the detection limit of 0.3 $\mu g/L$) to a maximum of 4 $\mu g/L$.

Although detectable concentrations of volatiles were noted in the vicinity of the reported location of UST 82 and near Building 36, the concentrations are very low and are not considered to indicate significant, if any, contamination. Concentrations were greatest in samples collected near Building 36 and in one sample in the northwest corner of the building. However, trace-to-low concentrations of TVHCs were nearly ubiquitous at this site and are not considered to be of concern. The slightly greater levels of volatiles near the building may indicate minor tank leakage if the UST was located (or exists) adjacent to the building. The results may also reflect localized surface spillage in and around the surveyed area.

Carbon dioxide was reported at all locations, with concentrations ranging from 690 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 3,800 $\mu g/L$ (Appendix D). Methane, with a detection limit of 700 $\mu g/L$, was not detected at the site.

3.36.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 8,000 square feet, indicate that it is unlikely that a tank is present in the northern portion of the surveyed area reported to contain UST 82. Because of the large amount of cultural interference at this site, it is unknown whether an UST is present in the southern portion of the surveyed area or adjacent to Building 36.

The chemical results of 19 active soil gas samples collected at the reported site indicate that only trace concentrations of benzene, toluene, and TVHCs were detected in soil gas at most locations within the area surveyed. These trace levels are not considered to be of concern, and indicate that--if a tank is present or was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that UST 82 is unlikely to be present and the soil gas survey indicates only trace levels of soil contamination, no further action is recommended at this site.

3.37 UST 84

3.37.1 Tank Description and Investigation

The contents and location of UST 84 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 84 was described as a 3,000-gallon diesel fuel tank located east of Building 5 in the central portion of the Administration Area (see Plate 1). The reported location is near a former boiler room in the northeast corner of the building. (At UMDA, fuel tanks have typically been used to supply individual boiler systems such as that in Building 5.) A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 100- by 120-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatile soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 18 active soil gas samples were collected in a 25-foot

rectangular grid around the reported location of UST 84. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.37.2 Contamination Assessment

Figure 3-19 shows the reported location of UST 84 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that several small magnetic anomalies were detected in the surveyed area, though large amounts of cultural interference hindered clear interpretation of the data. However, it appears that the anomalies are associated with utilities or interferences from the building and not an UST.

Figure 3-20 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 84. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 18 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in 11 samples, with concentrations ranging from 0.05 (which is slightly greater than the detection limit of 0.04 μg/L) to a maximum of 0.4 μg/L. Toluene was detected at five locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is slightly greater than the detection limit of 0.08 μg/L) to a maximum of 0.4 μg/L. TVHCs were reported at 11 of the locations, with concentrations ranging from 0.3 (which is at the detection limit of 0.3 μg/L) to a maximum of 7 μg/L.

Concentrations of volatiles were detected north and south of the reported location of UST 84, but not in the samples collected at the reported UST location. The reported concentrations are very low and are not considered to indicate significant, if any, contamination. Concentrations were greatest in two samples collected directly south of the reported UST location and in two samples northwest of the reported UST location. However, trace concentrations of benzene and toluene

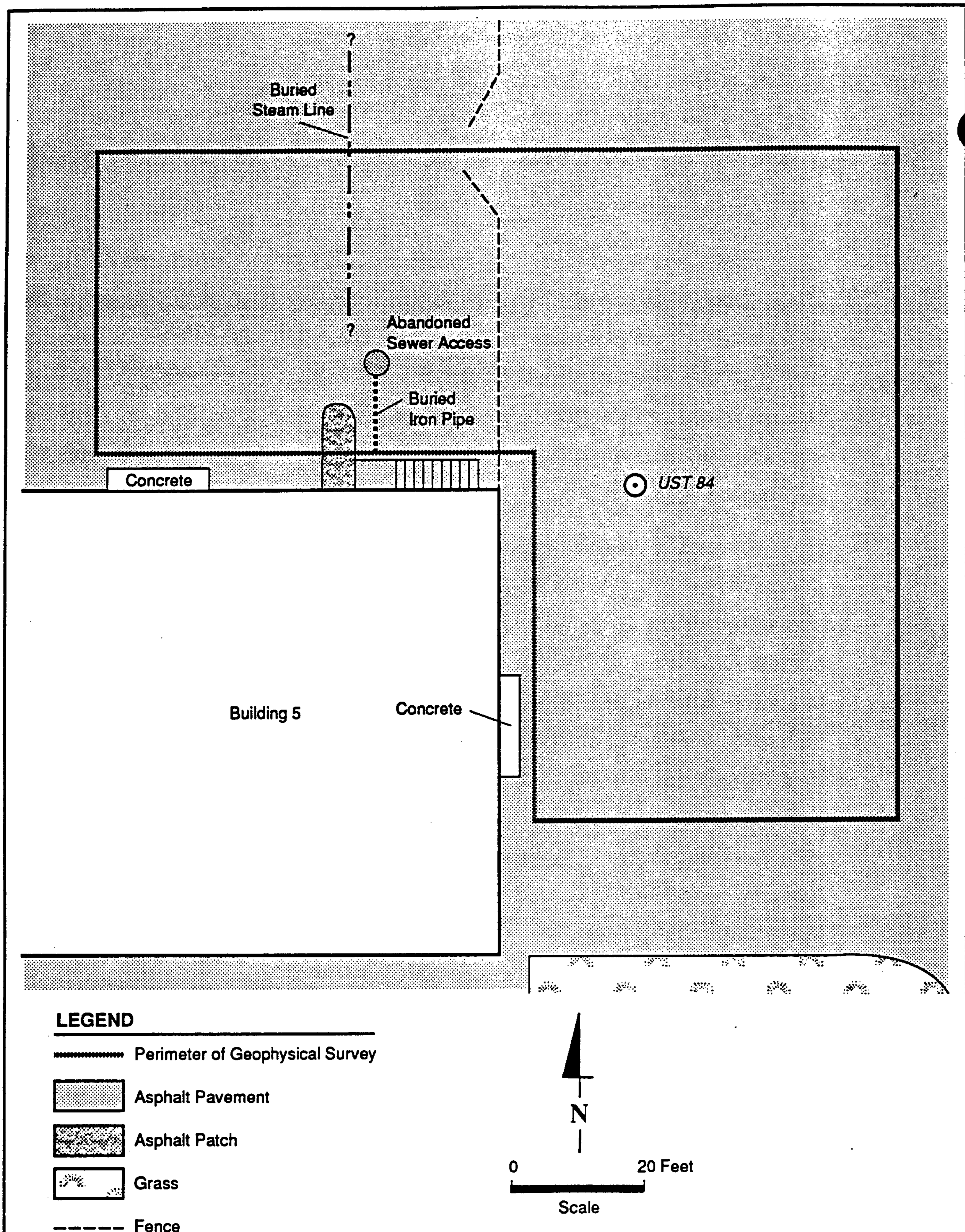
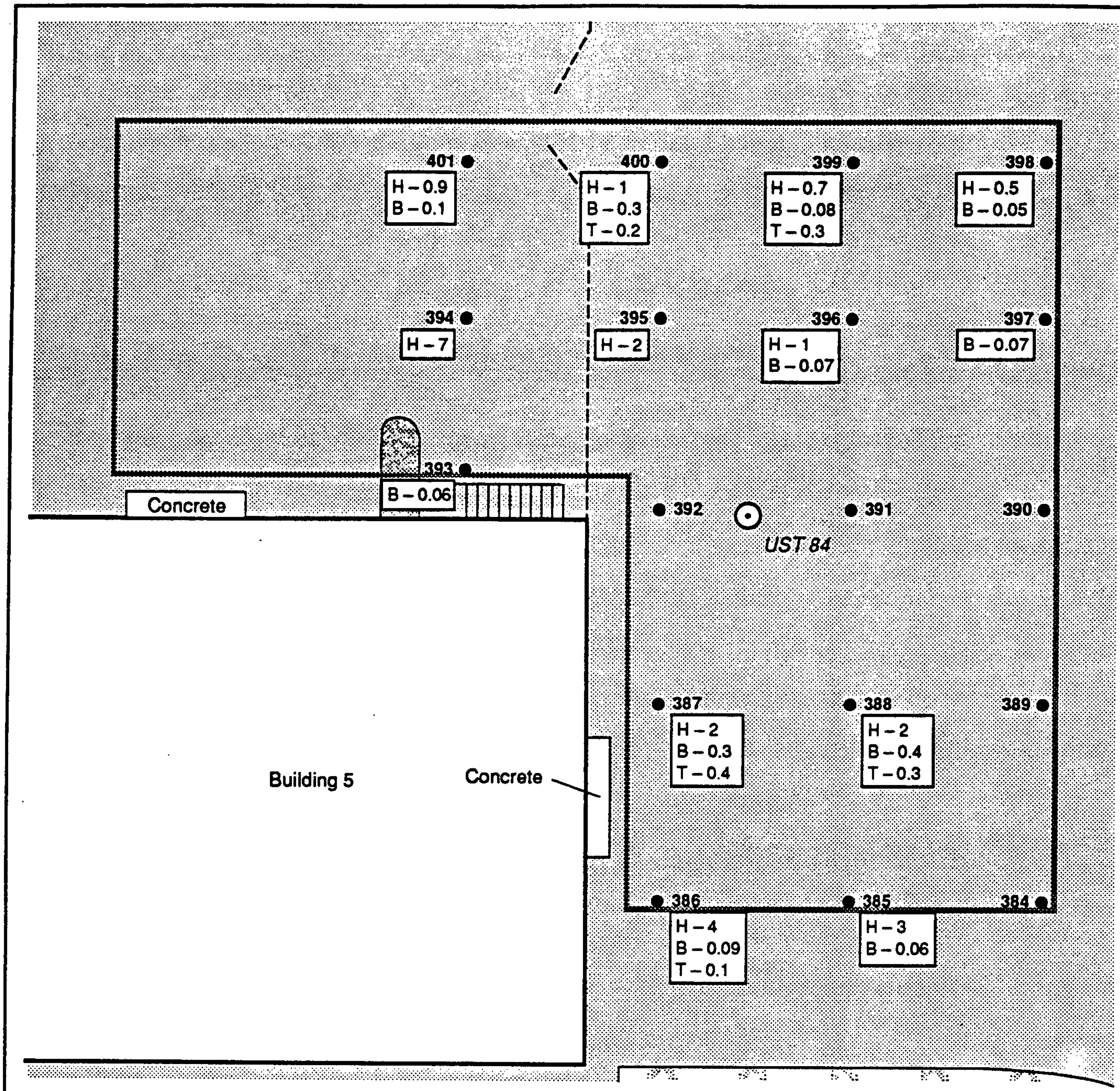


Figure 3-19
UST 84
RESULTS OF GEOPHYSICAL SURVEY



LEGEND

- Perimeter of Geophysical Survey
- Asphalt Pavement
- Asphalt Patch
- Grass
- Fence
- Reported UST Location *UST # in Italics* (Work Plan)
- ● 387 Sampling Probe Location and Number
  - H – <0.3 TVHC Sample Value (μg/L)
  - B – <0.04 Benzene Sample Value (μg/L)
  - T – <0.08 Toluene Sample Value (μg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

Figure 3-20
UST 84
RESULTS OF SOIL GAS SURVEY

and trace-to-moderate levels of TVHCs were somewhat ubiquitous at this site and are not considered to be of concern. The slightly greater levels of volatiles may indicate minor tank leakage if the UST was located here or may reflect the inadvertent introduction of asphalt constituents into the soil gas samples collected underneath the paved lots.

Carbon dioxide was reported at all locations, with concentrations ranging from 530 (which is slightly greater than the detection limit of 310 μg/L) to a maximum of 1,100 μg/L (Appendix D). Methane, with a detection limit of 750 μg/L, was not detected at the site.

3.37.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 12,000 square feet, indicate that it is unlikely that a tank is present beneath the surveyed area reported to contain UST 84.

The chemical results of 18 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, and TVHCs at most locations within the area surveyed. These trace levels are not considered to be of concern, and indicate that--if a tank was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that UST 84 is unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.38 UST 86

3.38.1 Tank Description and Investigation

The contents and location of UST 86 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 86 was described as a 3,000-gallon bunker fuel tank located at the eastern edge of the Administration Area, east of Cedar Street and Building 2, the

UMDA Fire Department (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 200- by 200-foot area. Surface magnetic and EM conductivity data were collected at 5- and 10-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 24 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 86. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.38.2 Contamination Assessment

Figure 3-21 shows the reported location of UST 86 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that an UST is present within the surveyed area. Several magnetic and EM conductivity anomalies observed at the site were not characteristic of an UST and appear to be associated with underground utilities. One strong anomaly was observed in both the magnetic and EM data coincident with a small surface depression located in the northeast corner of the survey site. However, upon staking the anomaly, a 4-

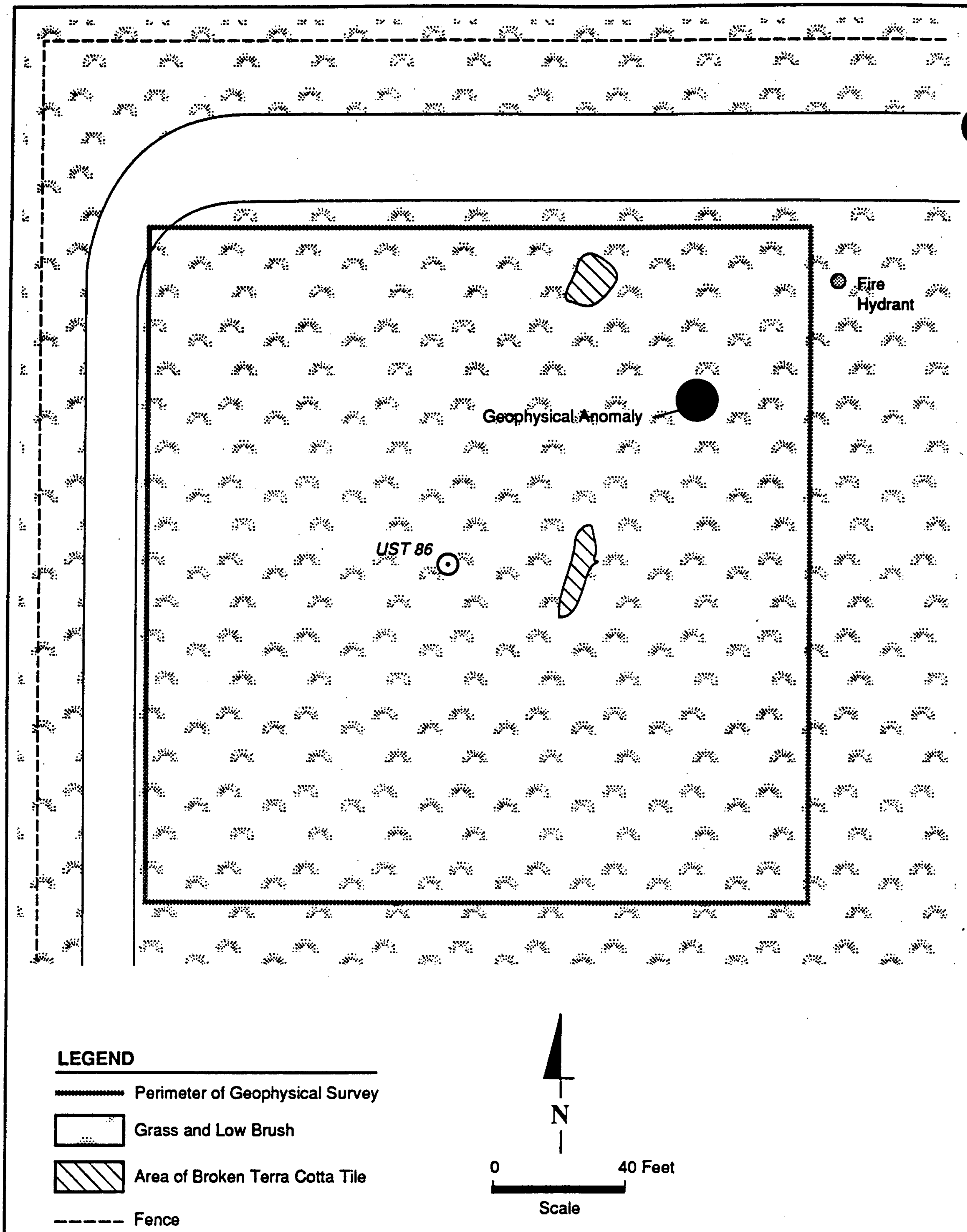


Figure 3-21
UST 86
RESULTS OF GEOPHYSICAL SURVEY

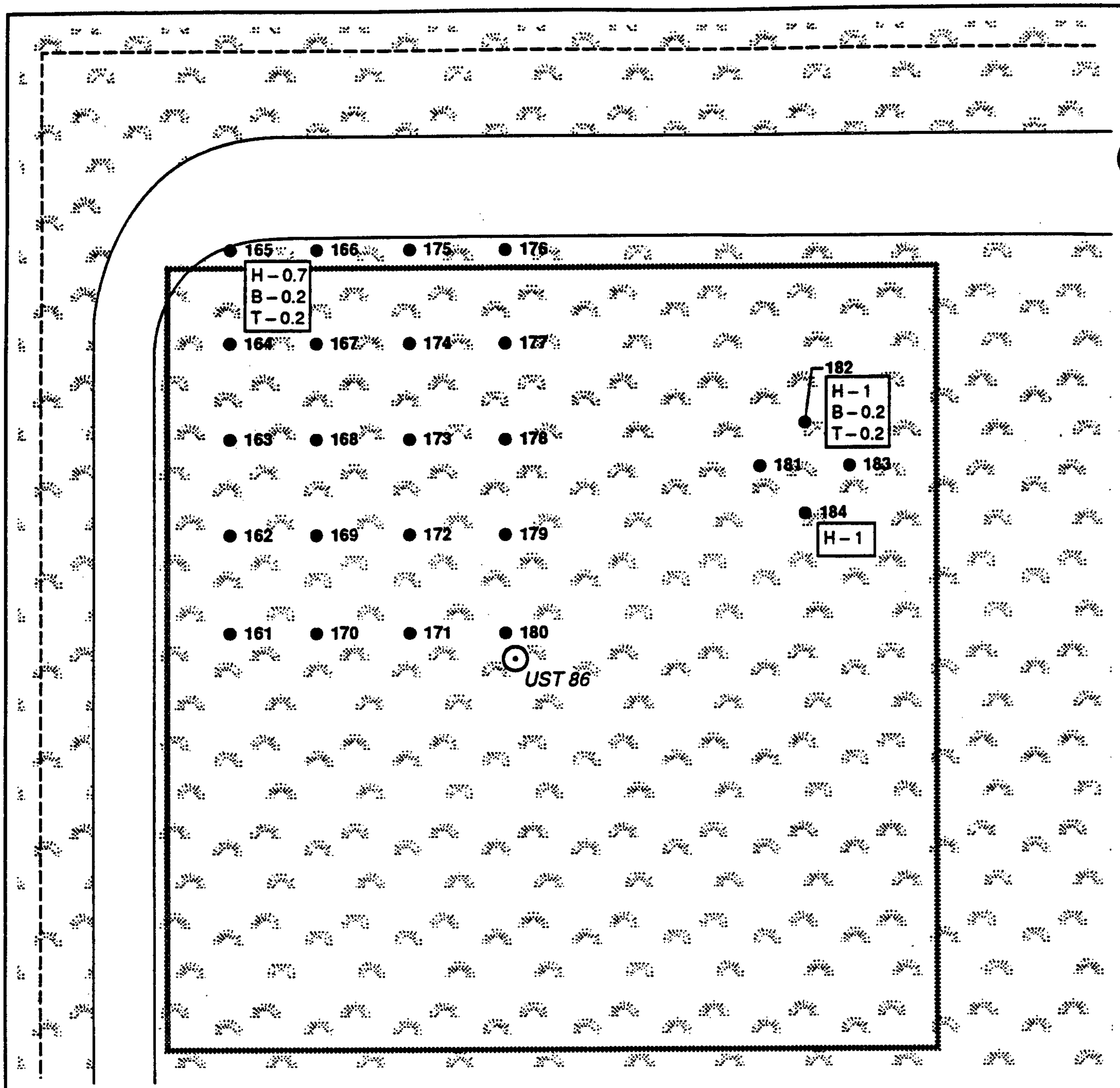
DAMES & MOORE

by 5-foot steel cover and empty vault were discovered approximately 1 foot below the ground surface.

Figure 3-22 presents the results for the BTEX and TVHC components of the active soil gas survey conducted at UST 86. Results of the carbon dioxide and methane components of the survey are shown in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at only a few of the 24 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in two samples, at a concentration of 0.2 $\mu g/L$ (which is slightly greater than the detection limit of 0.02 $\mu g/L$). Toluene was detected at two locations coincident with benzene detections; it was reported at a concentration of 0.2 $\mu g/L$ (which is slightly greater than the detection limit of 0.04 $\mu g/L$). TVHCs were reported at three locations, with concentrations ranging from 0.7 (which is slightly greater than the detection limit of 0.1 $\mu g/L$) to a maximum of 1 $\mu g/L$.

Although detectable concentrations of volatiles were reported in the immediate vicinity of the underground vault, the concentrations are very low and are not considered to indicate significant, if any, contamination. These and other volatiles concentrations do not exhibit a consistent or contiguous pattern typical of point sources of contamination such as a tank. The trace levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage around the vault.

Carbon dioxide was reported at all locations, with concentrations ranging from 740 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 7,200 $\mu g/L$ (Appendix D). Although the highest concentration of carbon dioxide is near two of the samples with detected volatiles, the levels do not correlate with volatile responses; nor do they indicate levels in excess of background concentrations commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 890 $\mu g/L$, was not detected at the site.



LEGEND

- Perimeter of Geophysical Survey
- Grass and Low Brush
- ------ Fence
- Reported UST Location *UST # in Italics* (Work Plan)
- ● 182 Sampling Probe Location and Number

H – <0.1	TVHC Sample Value (µg/L)
B – <0.02	Benzene Sample Value (µg/L)
T – <0.04	Toluene Sample Value (µg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

N

0 40 Feet

Scale

Figure 3-22
UST 86
RESULTS OF SOIL GAS SURVEY

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3.38.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 40,000 square feet, indicate that an UST is unlikely to be present in the area reported to contain UST 86. However, data from the geophysical survey do not indicate whether the UST had been located here and was removed.

The chemical results of 24 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, and TVHCs at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that UST 86 is unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.39 USTs 88 to 90

3.39.1 Tank Description and Investigation

The contents and locations of USTs 88 to 90 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). USTs 88, 89, and 90 were described as 500-gallon diesel fuel tanks located at the western edge of Area V, east of the intersection of Ironwood Road and Road G of Area III (see Plate 2). The tanks apparently supplied fuel for the operation of well pumps at Supply House No. 3. A followup field reconnaissance in February 1992 indicated no surficial evidence of present or former tanks--such as fill or vent pipes or stressed vegetation. However, small local surface depressions were observed at the site. No additional information was available from current UMDA employees, and it was uncertain whether the tanks existed and were removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tanks in the event that they were abandoned and remained underground at the

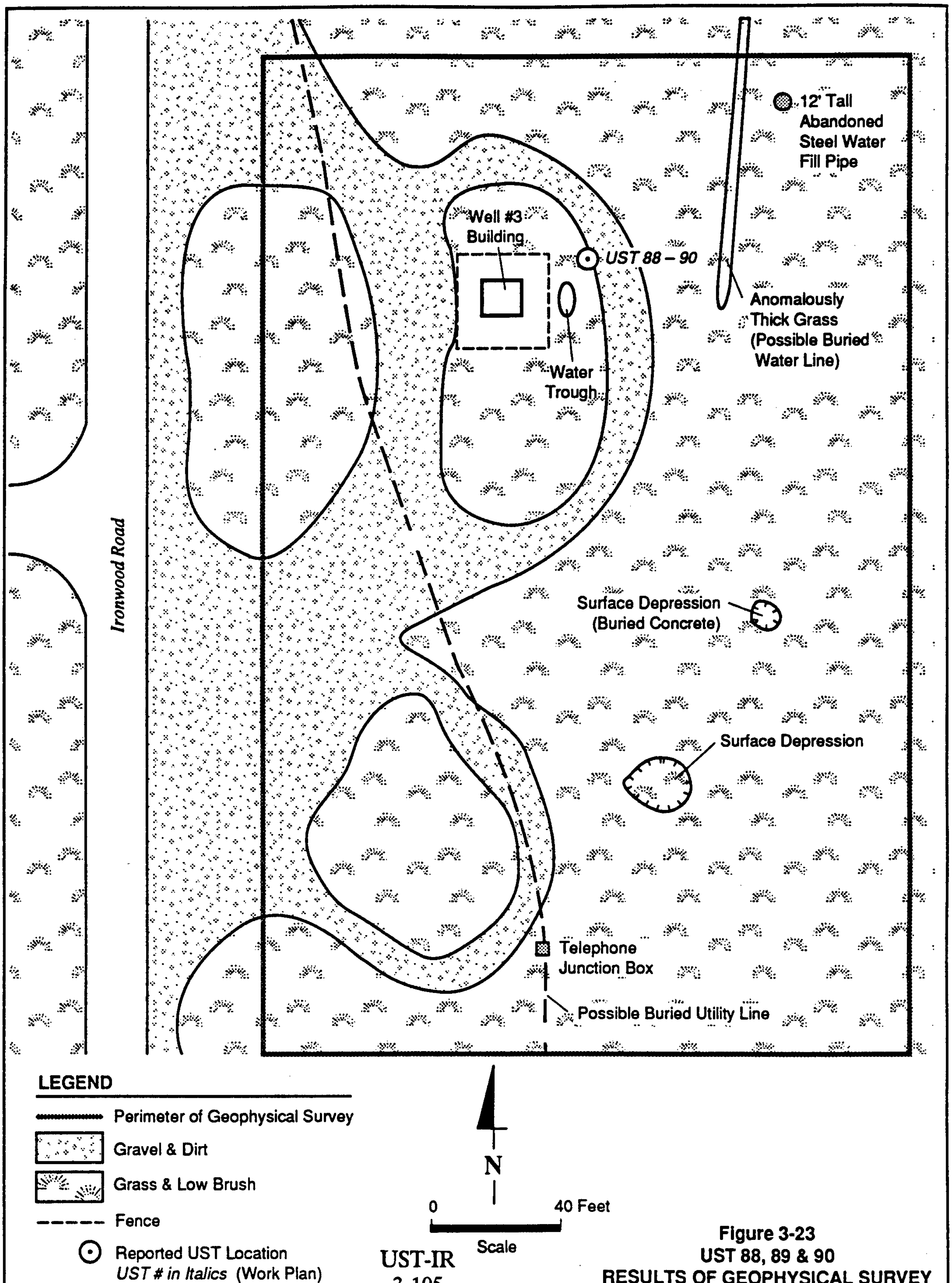
site. The survey was conducted around the reported location within a 300- by 200-foot rectangular area. Surface magnetic and EM conductivity data were collected at 10-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tanks (if they existed) had leaked but had been removed. A total of 60 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of the USTs. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.39.2 Contamination Assessment

Figure 3-23 shows the reported location of USTs 88 to 90 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that USTs are present within the surveyed area. Several magnetic anomalies were observed at the site, but they are not considered to be targets because they either were associated with underground utilities or were not confirmed by the EM data. Because of interference from aboveground structures near Supply House No. 3, it is unknown whether USTs are present within the fenced areas adjacent to the building.

Figure 3-24 presents the results for the BTEX and TVHC components of the active soil gas survey conducted at USTs 88 to 90. Two soil gas survey grids were established to concentrate on two areas at this site. The northern grid was set up at the reported location of the USTs. Because the geophysical survey did not locate the tanks, a southern grid was established in an area where surface depressions and buried concrete were observed. Also, the road pattern indicated that there may have been activity in this area. Results of the carbon dioxide and methane components of the



UST-IR
3-105

Figure 3-23
UST 88, 89 & 90
RESULTS OF GEOPHYSICAL SURVEY

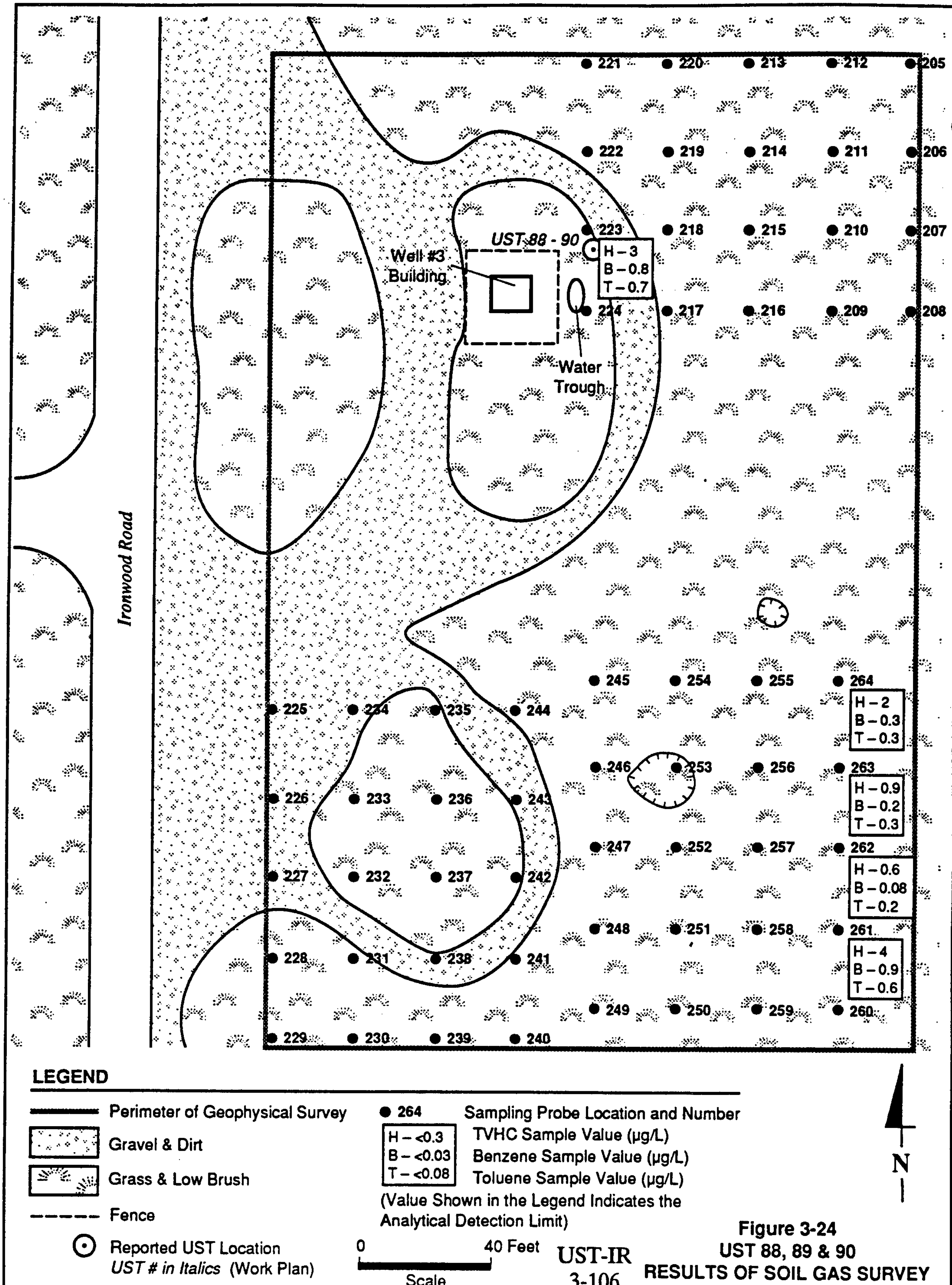


Figure 3-24
UST 88, 89 & 90
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

survey are shown in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at five locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in five samples, at a concentration of 0.08 μg/L (which is slightly greater than the detection limit of 0.03 μg/L). Toluene was detected at five locations coincident with benzene detections; it was reported at concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.09 μg/L) to a maximum of 0.7 μg/L. TVHCs were reported at five of the locations, with concentrations ranging from 0.6 (which is slightly greater than the detection limit of 0.3 μg/L) to a maximum of 4 μg/L.

Although detectable concentrations of volatiles were reported at the site, the concentrations are very low and are not considered to indicate significant, if any, contamination. These and other volatiles concentrations do not exhibit a consistent or contiguous pattern typical of point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage near the gravel road and areas east of the road.

Carbon dioxide was reported at 59 locations, with concentrations ranging from 940 (which is slightly greater than the detection limit of 340 μg/L) to a maximum of 4,800 μg/L (Appendix D). The carbon dioxide levels do not correlate well with volatiles responses, nor do they indicate levels in excess of background concentrations commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 840 μg/L, was not detected at the site.

3.39.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 60,000 square feet, indicate that USTs are unlikely to be present in the area reported to contain USTs 88 to 90. However, data from the geophysical survey do not indicate whether the USTs had been located here and were removed. Additionally, it is

unknown whether USTs are present within the fenced area adjacent to Supply House No. 3.

The chemical results of 60 active soil gas samples collected at the reported site indicate that only trace concentrations of benzene, toluene, and TVHCs were detected in soil gas at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if tanks were located here--they did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that USTs 88 to 90 are unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.40 UST 91

3.40.1 Tank Description and Investigation

The contents and location of UST 91 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 91 was described as a 250-gallon diesel fuel tank located at the eastern edge of Area V, west of the intersection of Rim Road and Road A of Block C of Area VII (see Plate 2). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 200- by 200-foot area. Surface magnetic and EM conductivity data were collected at 10-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 20 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 91. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.40.2 Contamination Assessment

Figure 3-25 shows the reported location of UST 91 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that an UST is present within the surveyed area. Several small and weak magnetic anomalies were observed, but they are not considered geophysical targets because they could not be confirmed by the EM data.

Figure 3-26 presents soil gas results for the BTEX and TVHC components of the active soil gas survey conducted at UST 91. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, xylene, and TVHCs at only a few of the 20 sampled locations. Ethylbenzene was not detected at this site. Benzene was detected in five samples, with concentrations ranging from 0.07 (which is slightly greater than the detection limit of 0.02 μg/L) to a maximum of 2 μg/L. Toluene was detected at four locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is slightly greater than the detection limit of 0.05 μg/L) to a maximum of 2 μg/L. Xylene was reported at one location at a concentration of 2 μg/L (which is one order of magnitude greater than the detection limit of 0.2 μg/L). TVHCs were reported at five locations, with concentrations ranging from 0.4 (which is slightly greater than the detection limit of 0.2 μg/L) to a maximum of 11 μg/L.

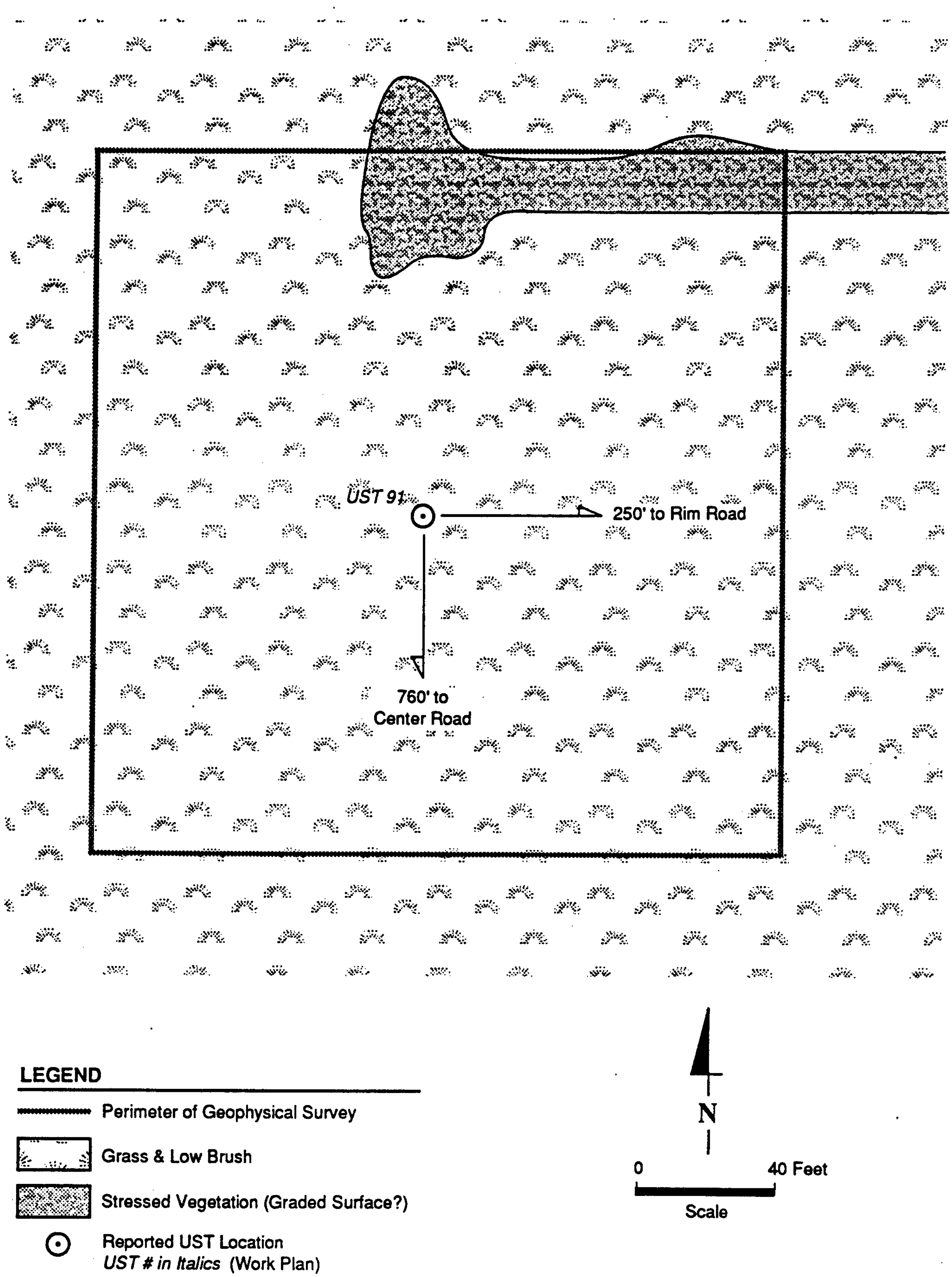
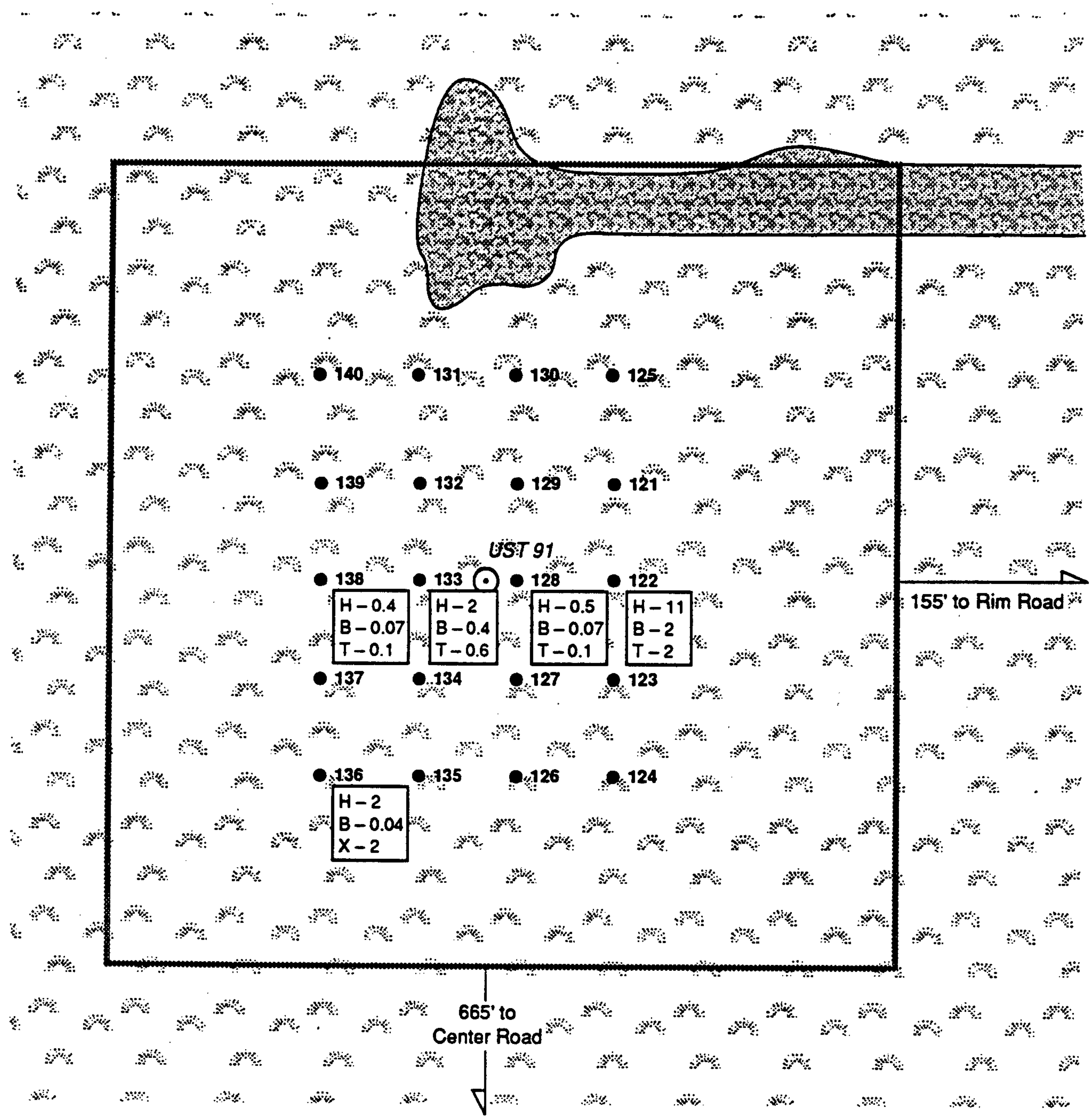


Figure 3-25
UST 91
RESULTS OF GEOPHYSICAL SURVEY



LEGEND

Perimeter of Geophysical Survey

Grass & Low Brush

Stressed Vegetation (Graded Surface?)

Reported UST Location
UST # in Italics (Work Plan)

● 138 Sampling Probe Location and Number

H – <0.2	TVHC Sample Value (µg/L)
B – <0.2	Benzene Sample Value (µg/L)
T – <0.05	Toluene Sample Value (µg/L)
X – <0.2	Xylenes Sample Value (µg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

N

0 40 Feet

Scale

Figure 3-26
UST 91
RESULTS OF SOIL GAS SURVEY

Although concentrations of volatiles were detected near the reported location of UST 91, the concentrations are low and are not considered to indicate significant, if any, contamination. The trace levels of volatiles may indicate minor contamination from localized surface spillage at the site or leakage from the tank, if it was located here; however, these levels are not considered to be of concern.

Carbon dioxide was reported at all locations, with concentrations ranging from 680 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 3,500 $\mu g/L$ (Appendix D). Although the slightly elevated level of carbon dioxide (3,500 $\mu g/L$) at SG-122 is associated with the maximum level of volatiles detected at this site, the remaining carbon dioxide levels are not consistently in excess of concentrations commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 1,000 $\mu g/L$, was not detected at the site.

3.40.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 40,000 square feet, indicate that an UST is unlikely to be present in the area reported to contain UST 91. However, data from the geophysical survey do not indicate whether UST 91 had been located here and was removed.

The chemical results of 20 active soil gas samples collected at the reported site indicate that only trace concentrations of benzene, toluene, xylene, and TVHCs were detected in soil gas at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that UST 91 is unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.41 UST 92

3.41.1 Tank Description and Investigation

UST 92 is adjacent to the south side of Building 486 (RI study Site 47, Boiler/ Laundry Effluent Discharge Site), where contaminants were discharged to a nearby trench and pit during the cleaning of explosives-contaminated clothing (Dames & Moore, 1992b). Although the fill pipe and cap are painted yellow, which is typical of UMDA fuel tanks, the tank is located in an area not readily available to fuel service. Staining--which is typical of fuel tank fill pipes and surrounding soil--was not observed during the February 1992 field survey. No information regarding the contents or use of this tank was available from UMDA records or current employees. During the field investigation, it was determined that UST 92 contained approximately 6 inches of what appeared to be diesel fuel. However, it was unknown whether fuel, waste, or chemical products associated with laundry and ammunition washout operations were stored here; the liquid (sample WO-2) was collected from UST 92 and analyzed for TCL VOAs, TCL BNAs, TAL inorganics, TCL PCBs, nitrate/nitrite, TPHCs, and explosives.

3.41.2 Contamination Assessment

The chemical analysis results of the liquid collected from UST 92 are presented in Table 3-1. Because groundwater standards are inappropriate to use as comparison criteria for tank contents, no comparison criteria were used for UST 92. Instead, detected analytes are discussed if they exceeded their CRLs.

As indicated in Table 3-1, of 17 TAL inorganics detected in the contents of UST 92, only two exceeded their CRLs. Lead was detected at a concentration of 1,400 $\mu g/g$, and mercury was detected at a concentration of 9.89 $\mu g/g$.

Four TCL VOAs were detected in the contents of UST 92--benzene at 20 $\mu g/g$, ethylbenzene at 7,010 $\mu g/g$, toluene at 8,010 $\mu g/g$, and xylenes at 20,000 $\mu g/g$.

Two VOA TICs were also detected--1-ethyl-2-methylbenzene at 300 μg/g and methylcyclohexane at 100 μg/g. Four unknown VOA TICs were detected at a total concentration of 190 μg/g.

Five TCL BNAs were detected in UST 92. Concentrations ranged from 20 to 12,000 μg/g for the following constituents--2-methylnaphthalene, bis(2-ethylhexyl)phthalate, fluorene, naphthalene, and phenanthrene.

Four BNA TICs--ethylbenzene, propylbenzene/n-propylbenzene, toluene, and tridecane--were detected at concentrations ranging from 3,000 to 8,010 μg/g. Sixteen unknown BNA TICs were also detected at a total concentration of 157,000 μg/g.

No TCL PCBs were detected in the tank contents.

3.41.3 Conclusions and Recommendations

Although groundwater comparison criteria are inappropriate for tank contents samples, the detected concentrations of two metals (lead and mercury), TCL VOAs, and TCL BNAs were high. It is recommended that UST 92 be cleaned out and decontaminated. The U.S. Army may consider closing the tank in accordance with State tank closure procedures.

3.42 UST 93

3.42.1 Tank Description and Investigation

UST 93 appears to be a vented sump that may have received boiler/laundry effluent from Building 486 (RI study Site 47, Boiler/Laundry Effluent Discharge Site). It is constructed of concrete. The discharge of wastes from washing explosives-contaminated clothing was reported to have occurred at Building 486. The sump is located in line with the concrete step-down sump adjacent to the building and the associated septic tank and tile fields. Because sludge from the step-down sump was found to be significantly contaminated with metals, nitrate/nitrite, TCL BNAs, and pesticides (Dames & Moore, 1992b), the potential for similar contaminants occurring in sludge or liquid at UST 93 was of concern. However, during the field investigation,

only liquid was present in UST 93 for sampling; a trace quantity of sediment was observed in the sump, but the amount was not enough for sampling and analysis. Sample WO-3--a liquid that appeared to be a rusty aqueous solution--was collected and analyzed for TCL BNAs, TAL inorganics, TCL pesticides/PCBs, and nitrate/nitrite. In addition, the sample was analyzed for explosives and TCL VOAs, because wastes from cleaning explosives-contaminated clothing and general activities may have been discharged here. (Note: After collecting the tank contents sample, UST 93 was removed from the UST investigation and listed for removal and closure under the UMDA tank closure plan.)

3.42.2 Contamination Assessment

The chemical analysis results of the liquid collected from UST 93 are presented in Table 3-1. Because groundwater standards are inappropriate to use as comparison criteria for tank contents, no comparison criteria were used for UST 93. Instead, detected analytes are discussed if they exceeded their CRLs.

As indicated in Table 3-1, the sample collected from UST 93 (WO-3) contained a number of TAL metals. Several of the ions with elevated concentrations (e.g., calcium, magnesium, potassium, and sodium) are common constituents of rainwater, which may have entered the sump through the vent. The elevated levels of the metals may have resulted from the evaporation of standing water in the sump or from common earth constituents brought into solution by contact with piping, concrete, or sediment. No explosives, TCL VOAs, TCL BNAs, TCL pesticides/PCBs, or nitrate/ nitrite were detected in sample WO-3.

3.42.3 Conclusions and Recommendations

Although groundwater comparison criteria are inappropriate for tank contents samples, the concentrations of eight metals detected in UST 93 were high. It is recommended that the tank be cleaned out and decontaminated. The U.S. Army may consider closing the tank in accordance with State tank closure procedures.

3.43 UST 96

3.43.1 Tank Description and Investigation

UST 96 is located in the southeast corner of UMDA near a concrete pad, adjacent to a former airfield (see Plate 2). It was discovered during the February 1992 field reconnaissance; no information on the tank was available from UMDA records or personnel. The UST appears to be associated with a pressure tank used for water. However, the fill and vent pipes are painted yellow, which is typical of UMDA fuel tanks. Visual assessment of a dip sample collected during the 1992 field reconnaissance indicated that 3 to 4 inches of a clear, odorless liquid was present in the tank--which may be water from condensation or from part of a former airport water delivery system. Because the contents could not be confirmed by UMDA records or personnel, a tank liquid sample (WO-4) was collected and analyzed for TCL VOAs, TCL BNAs, TAL inorganics, TCL pesticides/PCBs, TPHCs, and nitrate/nitrite.

3.43.2 Contamination Assessment

Chemical analysis results of the liquid collected from UST 96 are presented in Table 3-1. Because groundwater standards are inappropriate to use as comparison criteria for tank contents, no comparison criteria were used for UST 96. Instead, detected analytes are discussed if they exceeded their CRLs. As indicated in Table 3-1, the sample collected from UST 96 (WO-4) contained a number of TAL metals. Trace concentrations of three TCL VOAs were also reported for the sample, but are not considered to be a concern. No TCL BNAs, TCL pesticides/PCBs, TPHCs, or nitrate/nitrite were detected in the tank sample.

3.43.3 Conclusions and Recommendations

Because of the elevated concentrations of iron, lead, and manganese detected in the tank's contents, it is recommended that UST 96 be cleaned out and decontaminated. The U.S. Army may consider closing the tank in accordance with State tank closure procedures.

3.44 UST 97

3.44.1 Tank Description and Investigation

UST 97 is a small, round steel tank partially buried and located in front of Building 433. The tank has a diameter of approximately 2.5 feet, a length of 4 to 5 feet, and an estimated capacity of 150 to 180 gallons. According to current UMDA personnel, UST 97 was most likely a blowdown tank for an air compressor used in the building. Because of the uncertainty regarding material stored in this tank, the contents were to be sampled and chemically analyzed for TCL VOAs, TCL BNAs, TAL inorganics, TCL pesticides/PCBs, and TPHCs. However, UST 97 was determined to be empty, and no sample was collected.

3.44.2 Contamination Assessment

Because UST 97 was empty, there appears to be no contamination concern.

3.44.3 Conclusions and Recommendations

It is recommended that UST 97 be cleaned out and decontaminated. The U.S. Army may consider closing the tank in accordance with State tank closure procedures.

3.45 UST 98

3.45.1 Tank Description and Investigation

UST 98 is a 4-foot-square concrete sump located at the northeast corner of Building 486 (RI study Site 47, Boiler/Laundry Effluent Discharge Site). The sump received effluent from a discharge pipe that drained wash basins and floor drains located inside the building. Sludge is present in the bottom of the sump. Because sludge from a similar sump at Building 486 was found to be significantly contaminated with metals, nitrate/nitrite, TCL BNAs, and pesticides (Dames & Moore, 1992b), the potential presence of similar contaminants in the sludge in UST 98 was of concern. Based on results of the previous sump sample collected at Building 486, a sludge sample (WO-6) and a duplicate sample were collected from UST 98 and analyzed for

TAL metals, TCL BNAs, TCL pesticides/PCBs, and nitrate/nitrite. In addition, the samples were analyzed for explosives, because the sump may have received wastes from the laundering of explosives-contaminated clothes or from other decontamination activities. Because other contaminants--such as solvents for cleaning or oils associated with mechanical work--may have been discharged to this floor drain sump, the samples were also analyzed for TCL VOAs and TPHCs.

3.45.2 Contamination Assessment

Chemical analysis results for the sludge collected from UST 98 are presented in Table 3-1. Because groundwater and soil standards are inappropriate to use as comparison criteria for tank contents, no comparison criteria were used for UST 98. Instead, detected analytes are discussed if they exceed their CRLs.

As indicated in Table 3-1, the sludge sample collected from UST 98 contained 23 TAL metals. These results were confirmed by analysis of the duplicate sample. Nitrate/nitrite, TPHCs, and low levels of one explosive, three TCL pesticides, and one TCL PCB were also detected in both samples. No TCL VOAs or TCL BNAs were detected in either sample.

3.45.3 Conclusions and Recommendations

Because of the high concentrations of metals and TPHCs and the presence of explosives, TCL pesticides, one TCL PCB, and nitrate/nitrite detected in the contents of UST 98, it is recommended that the tank be cleaned out and decontaminated. The U.S. Army may consider closing the tank in accordance with State tank closure procedures.

3.46 UST 99

3.46.1 Tank Description and Investigation

The location of UST 99 was identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 99 was a tank of unknown contents and capacity reportedly located in the vicinity of

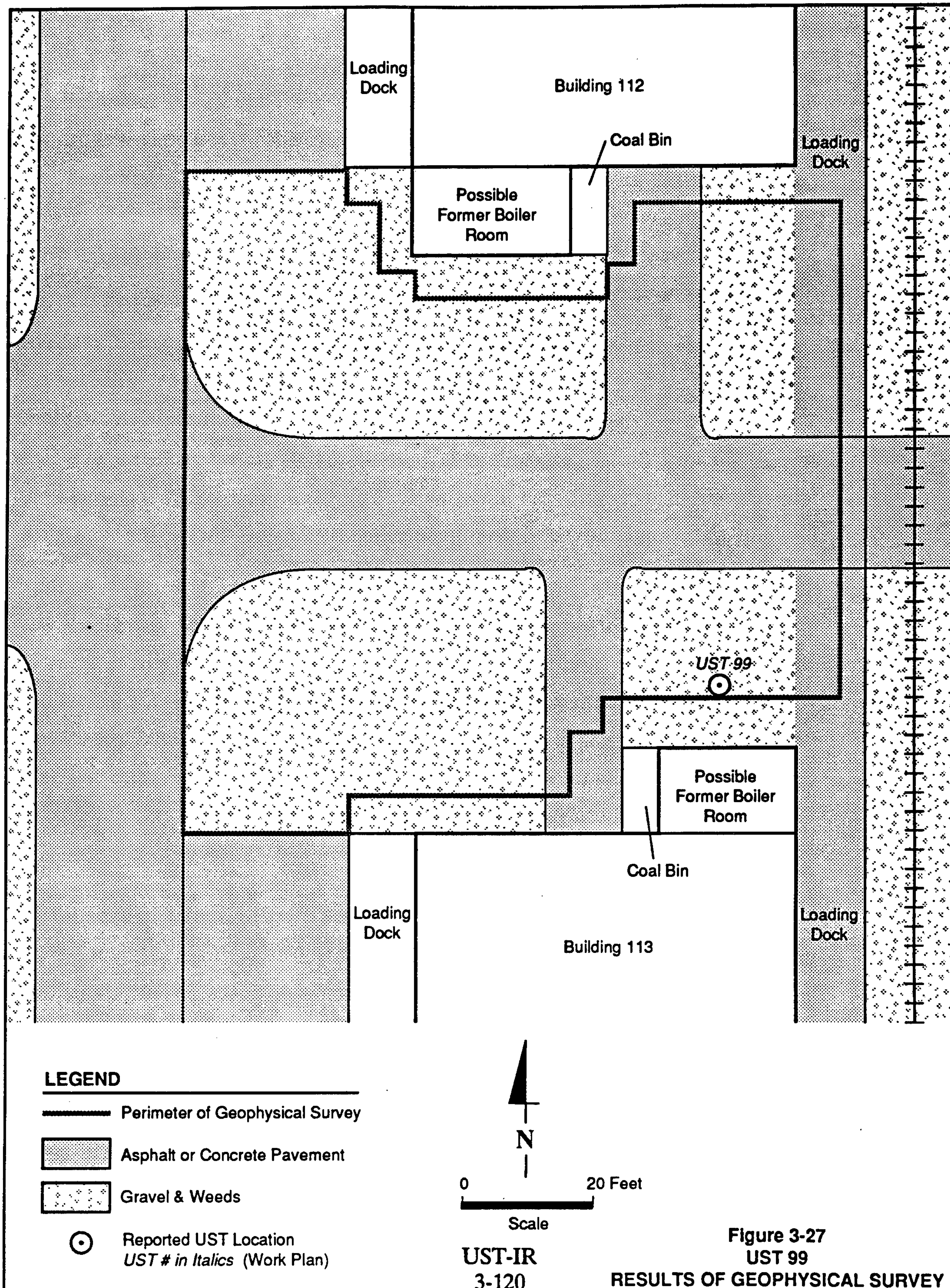
Building 113 in the warehouse section of Area II (see Plate 2). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. No additional information was available from current UMDA employees, and it was uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, a geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported UST location within a 95- by 100-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. A total of 20 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of UST 99. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.46.2 Contamination Assessment

Figure 3-27 shows the reported location of UST 99 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that an UST is present within the surveyed area. Several small and weak anomalies were observed, but they are associated with cultural interference from structures such as buildings and utilities. Although such interference hindered the interpretation of magnetic data, no UST targets were indicated by the EM results.



UST-IR
3-120

Figure 3-27
UST 99
RESULTS OF GEOPHYSICAL SURVEY

DAMES & MOORE

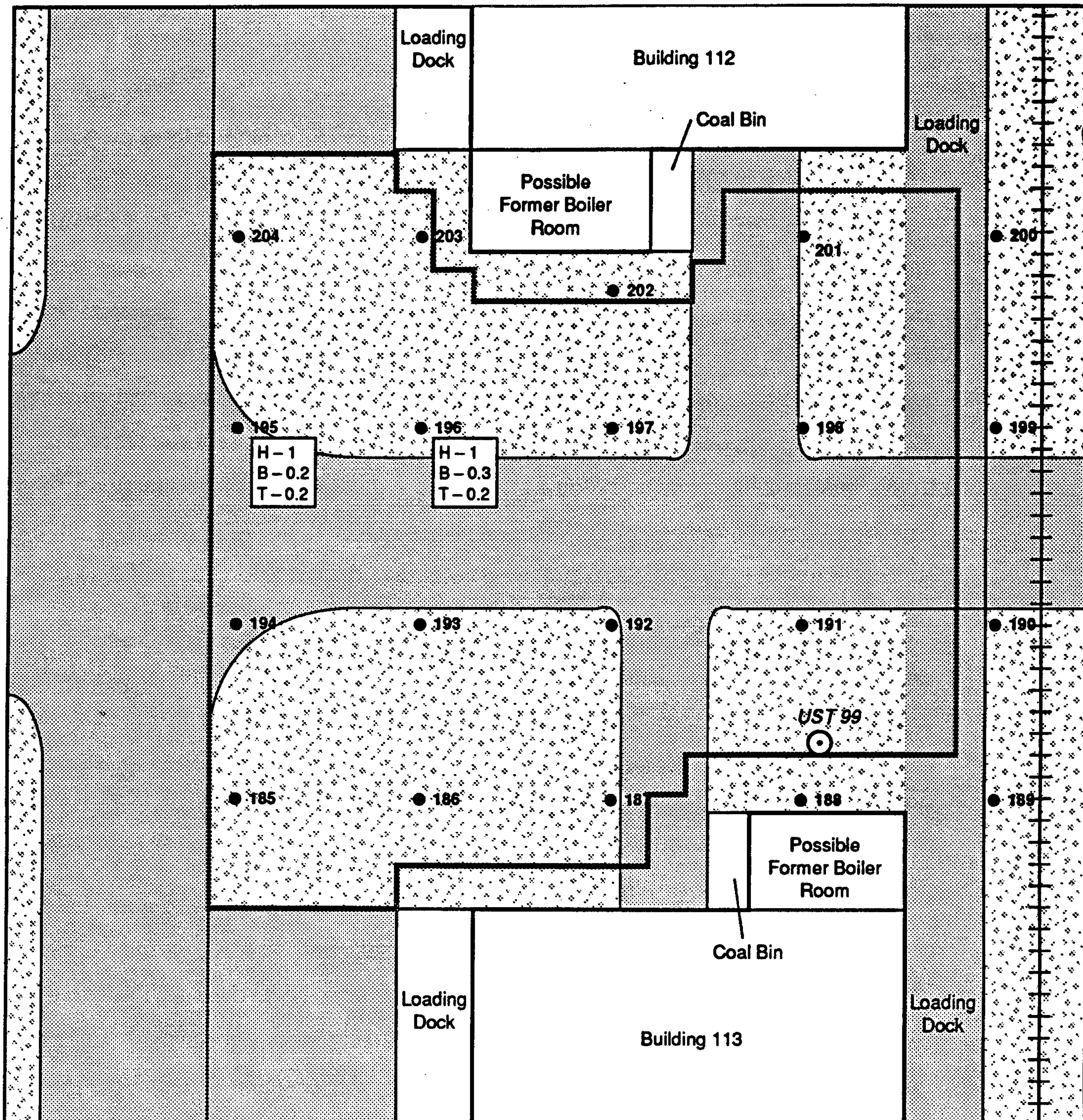
Figure 3-28 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 99. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at two of the 20 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in two samples, with concentrations ranging from 0.2 (which is nearly one order of magnitude greater than the detection limit of 0.03 $\mu g/L$) to a maximum of 0.3 $\mu g/L$. Toluene was detected at both locations coincident with benzene detections; it was reported at a concentration of 0.2 $\mu g/L$ (which is slightly greater than the detection limit of 0.09 $\mu g/L$). TVHCs were reported at both locations, at a concentration of 1 $\mu g/L$ (which is slightly greater than the detection limit of 0.4 $\mu g/L$).

Although detectable concentrations of volatiles were reported at the site, the concentrations are low and are not considered to indicate significant, if any, contamination. The trace levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage or asphalt constituents near the roadway at the site.

Carbon dioxide was reported at all locations, with concentrations ranging from 1,100 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 4,000 $\mu g/L$ (Appendix D). Although a near maximum level of carbon dioxide (3,800 $\mu g/L$) at SG-195 is associated with volatiles detected at the site, this level is only slightly greater than the remaining carbon dioxide levels reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 900 $\mu g/L$, was not detected at the site.

3.46.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 9,500 square feet, indicate that an UST is unlikely to be present in the area reported to contain UST 99. However, data from the geophysical survey do not indicate whether UST 99 had been located here and was removed.



LEGEND

Perimeter of Geophysical Survey

Asphalt or Concrete Pavement

Gravel & Weeds

Reported UST Location
UST # in Italics (Work Plan)

● 195 Sampling Probe Location and Number

H – <0.3	TVHC Sample Value (µg/L)
B – <0.03	Benzene Sample Value (µg/L)
T – <0.08	Toluene Sample Value (µg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

N

0 20 Feet
Scale

Figure 3-28
UST 99
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

The chemical results of 20 active soil gas samples collected at the reported site indicate that only trace concentrations of benzene, toluene, and TVHCs were detected in soil gas at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if a tank was located here--it did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that UST 99 is unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.47 UST 100

3.47.1 Tank Description and Investigation

The contents and location of UST 100 were identified by former UMDA employees during interviews conducted as part of the Enhanced PA (Dames & Moore, 1990a). UST 100 was described as a diesel fuel tank of unknown capacity located below a covered piping and drum storage shed (Building 29) in the central portion of the Administration Area (see Plate 1). A followup field reconnaissance in February 1992 indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded or depressed soil surface), or stressed vegetation. A current UMDA employee with 32 years of service at Building 4 reported that he did not recall any installation, operation, or removal of an UST beneath the shed. The employee indicated that there was no need for a tank at this site. No documentation on the tank installation or removal was available from current UMDA employees; thus, it is uncertain whether the tank existed and was removed or abandoned in place.

Because of these uncertainties, an active soil gas survey was performed to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. (A geophysical survey was not attempted because of the likely interference by the overhead steel shelter and the

large quantity of metal items stored at the site.) Initially, 10 active soil gas samples were collected in a 25-foot rectangular grid below the shelter. Eight additional samples were collected outside the shelter area to delineate boundaries of significant soil gas contamination detected at the eastern end of the shelter. For the samples, soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

Based on the soil gas results, soil samples were collected from four borings (STA-28 through STA-31) in the areas reported to have the greatest TVHC concentrations to confirm the presence of volatiles and petroleum hydrocarbons in the soil. Boring locations are shown in Figure 3-29. Soil borings STA-28 and STA-31 were advanced to a depth of 10 feet, and soil samples were collected at the surface and at depths of 2.5, 5, 7.5, and 10 feet. Borings STA-29 and STA-30 were located adjacent to and beneath the shelter, respectively, so drilling was not possible. At these locations a hand auger was used for the boring, and soil samples were collected at the surface and at 1.5 feet. The samples collected from all four borings were chemically analyzed for TCL VOAs, TCL BNAs, and TPHCs.

3.47.2 Contamination Assessment

Figure 3-30 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 100. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate low-to-high levels of benzene, toluene, xylene, and TVHCs at some of the 18 sampled locations. However, ethylbenzene was not detected at this site. Benzene was detected at low levels in 10 samples, with concentrations ranging from 0.04 (which is at the detection limit of 0.04 μg/L) to a maximum of 0.7 μg/L. Toluene was detected at two locations coincident with benzene detections; it was reported at concentrations ranging from 0.4 (which is slightly greater than the detection limit of 0.1 μg/L) to a maximum of 0.5 μg/L. TVHCs were reported at 11 of the locations, with concentrations ranging from 0.4 (which is at the detection limit of 0.4 μg/L) to a maximum of 110 μg/L.

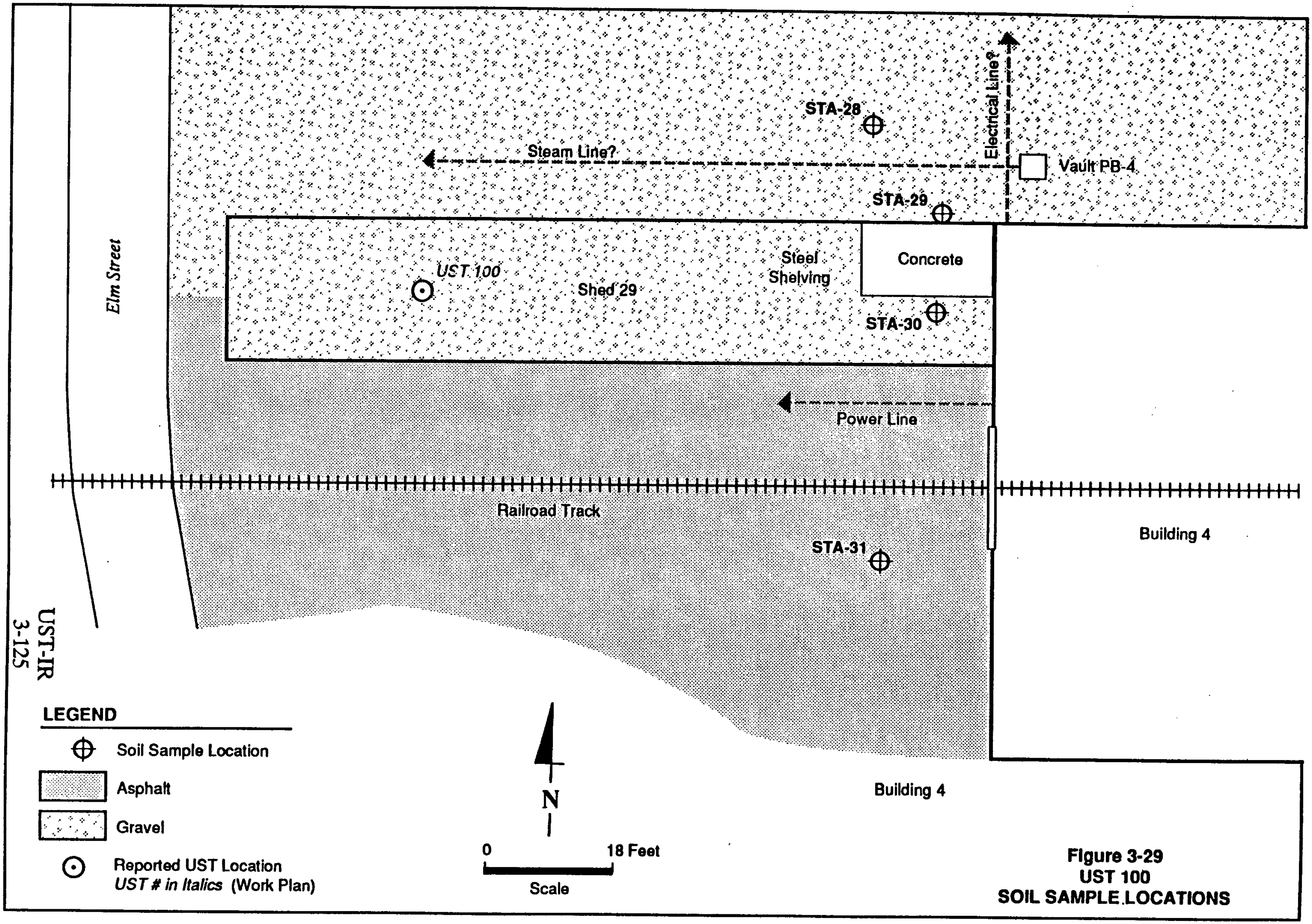


Figure 3-29
UST 100
SOIL SAMPLE LOCATIONS

DAMES & MOORE

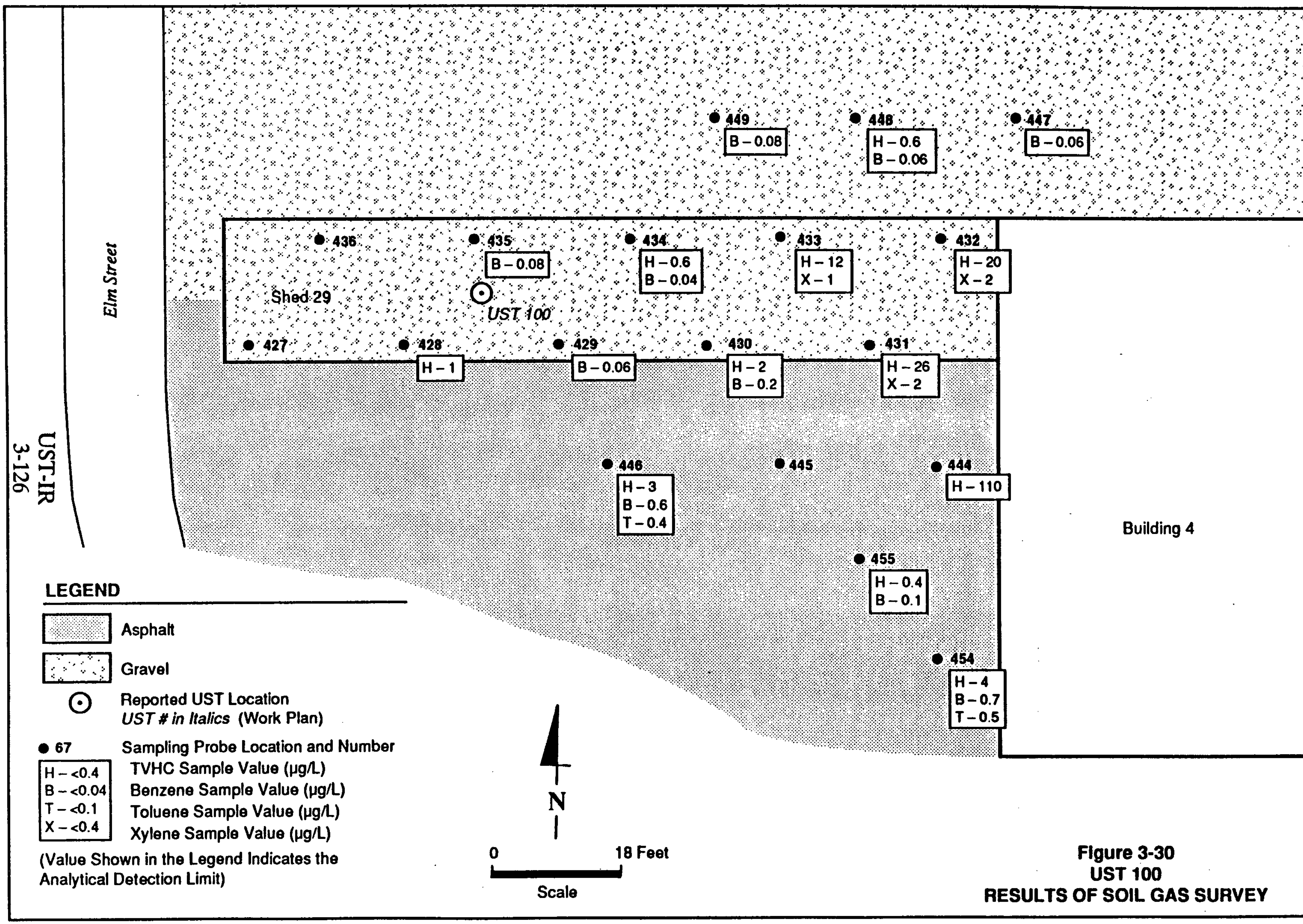


Figure 3-30
UST 100
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

With the exception of samples collected near the eastern edge of the shelter (SG-431 through SG-433) and south of the shelter (SG-444), the reported soil gas concentrations are low and are not considered to indicate significant, if any, contamination. The volatiles concentrations do not exhibit a consistent or contiguous pattern typical of point sources of contamination such as a tank. These low levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage from stored drums, piping, and other items at the shelter.

The soil gas results from samples SG-431 through SG-433 and SG-444, though possibly reflecting discrete surface spillage of fuel or oil, indicate potential contamination in the eastern quarter of the shelter. Although BTEX concentrations were low, levels of TVHCs for three adjacent samples collected in the eastern portion of the shelter ranged from 12 to 26 $\mu g/L$. Additionally, a concentration of 110 $\mu g/L$ was reported for SG-444, which was located approximately 13 feet south of the shelter. These elevated TVHC concentrations indicate potential contamination that may be of concern, though the contamination appears to be localized.

Carbon dioxide was reported at all locations, with concentrations ranging from 1,100 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 10,000 $\mu g/L$ (Appendix D). Although slightly elevated concentrations of carbon dioxide are associated with the two greatest concentrations of TVHCs reported for SG-444 and SG-431 (6,200 $\mu g/L$ and 8,500 $\mu g/L$, respectively), the remaining carbon dioxide levels do not correlate well with BTEX or TVHC responses. However, carbon dioxide levels of several other soil gas samples with significant TVHC and BTEX concentrations (e.g., SG-432 and SG-433) are not in excess of concentrations commonly reported for soil gas samples with no detectable BTEX and TVHCs. Methane, with a detection limit of 820 $\mu g/L$, was not detected at the site.

As indicated in Table 3-4, no TCL VOAs were detected in the soil samples collected at UST 100. Very low levels of one TCL VOA TIC and one unknown VOA

TIC were each detected in one soil sample. Four TCL BNAs were detected at low concentrations at the 2.5-foot depth in boring STA-28, and low concentrations of only two TCL BNAs were detected in the surface sample from boring STA-30. No TCL BNAs were detected in STA-29 or STA-31. Eight TCL BNA TICs and 15 unknown BNA TICs were detected in the 2.5-foot sample from boring STA-28. One BNA TIC was detected in another soil sample, and one unknown BNA TIC was detected in three additional samples.

TPHCs were detected at high concentrations in all four borings, though they appeared to be limited to surface and shallow subsurface soil. In boring STA-28, TPHC concentrations increased from 337 μg/g in the surface sample to 860 μg/g at 2.5 feet. No TPHCs were detected below this depth to 10 feet. In STA-29 and STA-30, TPHC concentrations decreased from 1,140 μg/g and 911 μg/g at the surface to 489 μg/g and 341 μg/g at 1.5 feet, respectively. However, the duplicate sample collected at 1.5 feet in boring STA-30 exhibited a TPHC concentration of 1,660 μg/g, indicating an increase in TPHC levels with depth. In boring STA-31, TPHCs were detected only in the surface sample, but at a high concentration of 3,320 μg/g.

PID readings of 0.2 ppm were detected at 1.5 feet in both STA-29 and STA-30. An oily odor was noted in STA-29, and an oily asphalt-like odor was noted in STA-30--but no asphalt was present at the surface. A PID reading of 3.5 ppm, accompanied by a slight petroleum odor, was detected in STA-28 at 2.5 feet.

3.47.3 Conclusions and Recommendations

The chemical results of 18 active soil gas samples collected at the reported site of UST 100 indicate trace concentrations of benzene, toluene, and xylene underneath and south of the shelter. These low concentrations may reflect localized surface spills of fuel and oil and are not considered to be a concern. However, moderate concentrations of TVHCs were reported at four sample locations, indicating potentially significant contamination underneath the eastern quarter of the shelter and slightly south of the shelter.

Although no TCL VOAs were detected in site soil samples and TCL BNA concentrations were low, TPHC concentrations detected in all four soil borings were high. No TPHCs were detected below a depth of 2.5 feet, indicating that contamination may be due to surface spills rather than a leaking tank. Although the levels of contamination present at and near the surface are high, the potential for vertical migration of contaminants to greater depths and to groundwater is not considered to be a concern, because samples collected at greater depths (to 10 feet) contained no detectable levels of contaminants. Therefore, only surficial migration via windblown dust may be a concern.

Based on results of the soil gas survey and soil sampling, it is recommended that the soil at the eastern quarter of Building 29 and slightly south of the shed be excavated and disposed of. Because the soil contaminants present in this area appear to be the result of surface spills and not directly related to UST 100, no immediate action is recommended.

3.48 UST 101

3.48.1 Tank Description and Investigation

UST 101 consists of a 1-inch pipe running above and below the ground from Building 419 to a distance of approximately 50 feet. Recent discussions with current UMDA employees indicate that the pipe is filled with oil from a hot oil boiler located in Building 419. According to UMDA personnel, no tank is used to store the oil. The oil may be a remnant from 20 years ago, when PCBs were commonly used; thus, a sample (WO-7) was collected and analyzed for TCL PCBs. In addition, four soil borings (STA-32 through STA-35) were drilled along the UST 101 pipeline. Soil sample locations are shown in Figure 3-31. Three of the borings (STA-32 to STA-34) were advanced to a depth of 8 feet. STA-35 was terminated at a depth of 6.8 feet. Because UST 101 is actually a pipeline, as discussed in Section 2.7, a soil sample was collected from each boring at 6.5 feet, and all samples were chemically analyzed for TCL VOAs, TCL BNAs, and TPHCs.

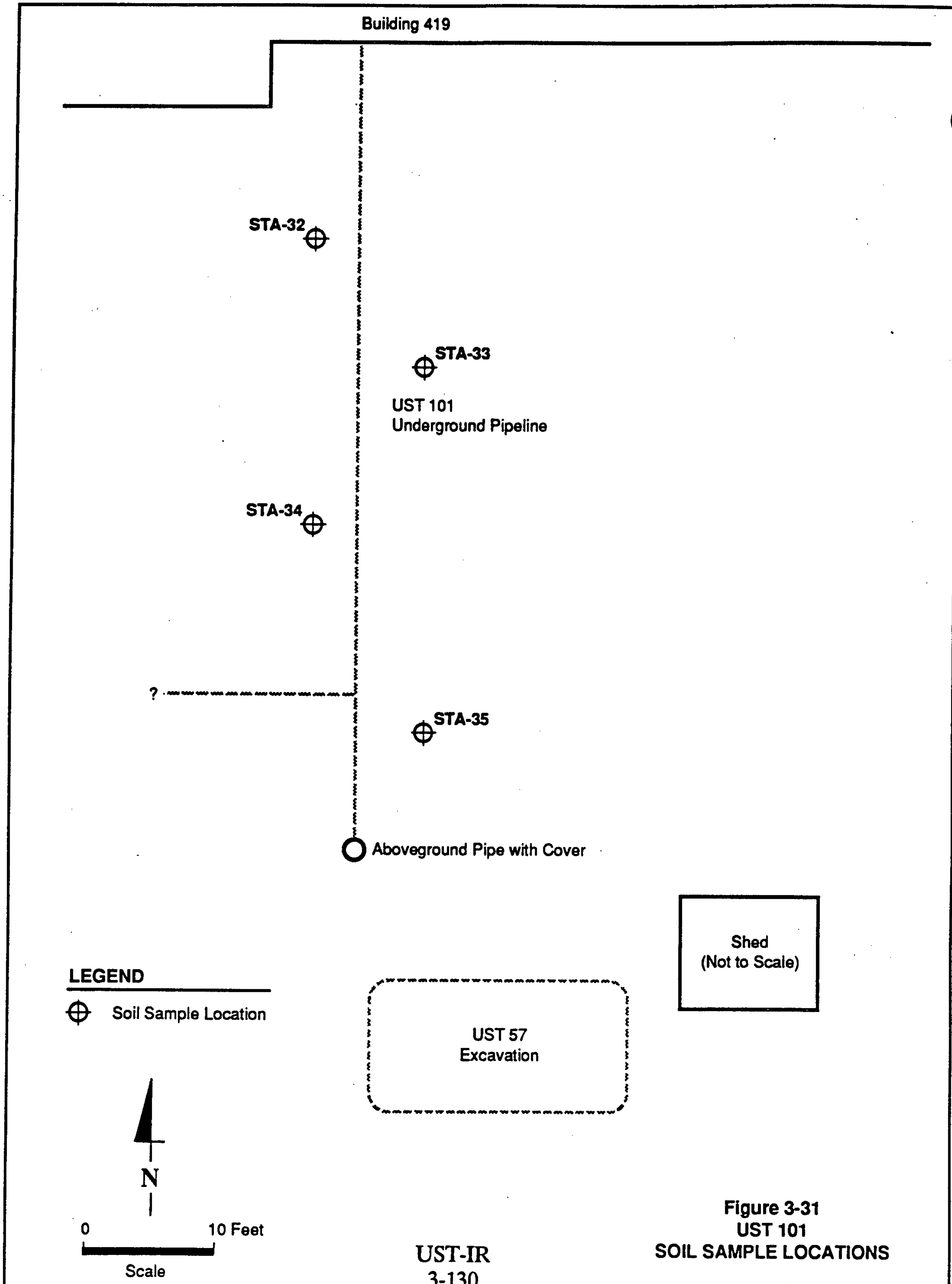


Figure 3-31
UST 101
SOIL SAMPLE LOCATIONS

3.48.2 Contamination Assessment

As indicated in Table 3-1, tank contents sampling results indicate that no constituents analyzed for were present in UST 101. As indicated in Table 3-4, no TCL VOAs, TCL BNAs, or TPHCs were detected. Very low levels of one known and one unknown VOA TIC were detected in only one sample. Based on these results, potential contamination due to a leaking pipeline is not considered to be a concern.

3.48.3 Conclusions and Recommendations

Because no contamination of concern was detected at UST 101, no further action is recommended.

3.49 UST 102

3.49.1 Tank Description and Investigation

The location of UST 102 is shown on a 1941 construction drawing (Stevens and Koon, 1941); it was reportedly located in the western portion of the Administration Area, approximately 110 feet south of Building 23, Fuel Oil Transfer Station (see Plate 1). UST 102 was a fuel oil tank with a capacity of 12,000 gallons. On the referenced drawing, it appears to be depicted as an aboveground storage tank (AST), though there are no references regarding its actual placement above or below ground. The tank supplied a small pump house (former Building 46) and may have supplied fuel to locomotives or vehicles.

A geophysical survey was conducted to locate the tank in the event that it was abandoned and remained underground at the site. The survey was conducted around the reported tank location within an 80- by 95-foot rectangular area. Surface magnetic and EM conductivity data were collected at 5-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

Observations made during the geophysical survey indicated no surficial evidence of a present or former tank--such as fill or vent pipes, disturbed soil (i.e., a mounded

or depressed soil surface), or stressed vegetation. However, a 5- by 8-foot concrete vault is present at the northern edge of the survey area. The location, orientation, and dimensions of the vault are similar to those on the construction drawing. This vault is believed to be the remains of Building 46, the UST 102 pump house.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tank (if it existed) had leaked but had been removed. Initially, 20 active soil gas samples were collected in a 25-foot rectangular grid around the reported location of the tank. Nine additional samples were collected to the south and east of the survey area to delineate the boundaries of soil gas contamination in these directions. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

Based on soil gas results, soil samples were collected from three 10-foot borings (STA-36 through STA-38) in the areas east of UST 102 reported to have the greatest TVHC concentrations. Soil sampling locations are shown in Figure 3-32. In borings STA-36 and STA-37, samples were collected at the surface and at depths of 2.5, 7.5, and 10 feet. In STA-38, samples were collected at the surface and at depths of 2.5, 5, 7.5, and 10 feet. All samples were chemically analyzed for TCL VOAs, TCL BNAs, and TPHCs.

3.49.2 <u>Contamination Assessment</u>

Figure 3-33 shows the reported location of UST 102 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that a strong underground geophysical target is located immediately west of the concrete vault. These results suggest that two targets may be underground at the anomaly location. Based on typical dimensions of tanks with this capacity, the size of the anomaly--which is approximately 16 by 20 feet--also suggests the presence of two tanks placed side-by-side.

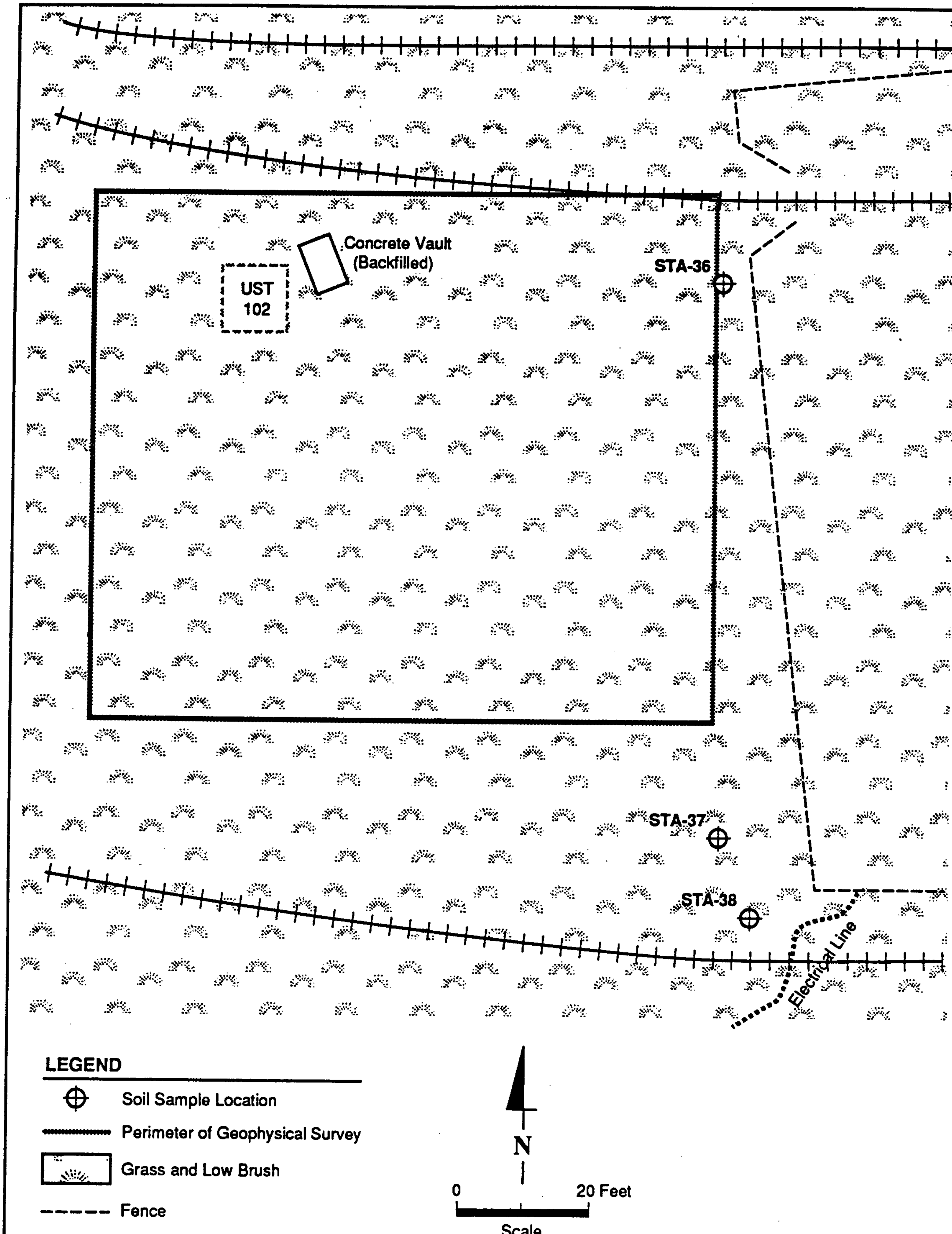


Figure 3-32
UST 102
SOIL SAMPLE LOCATIONS

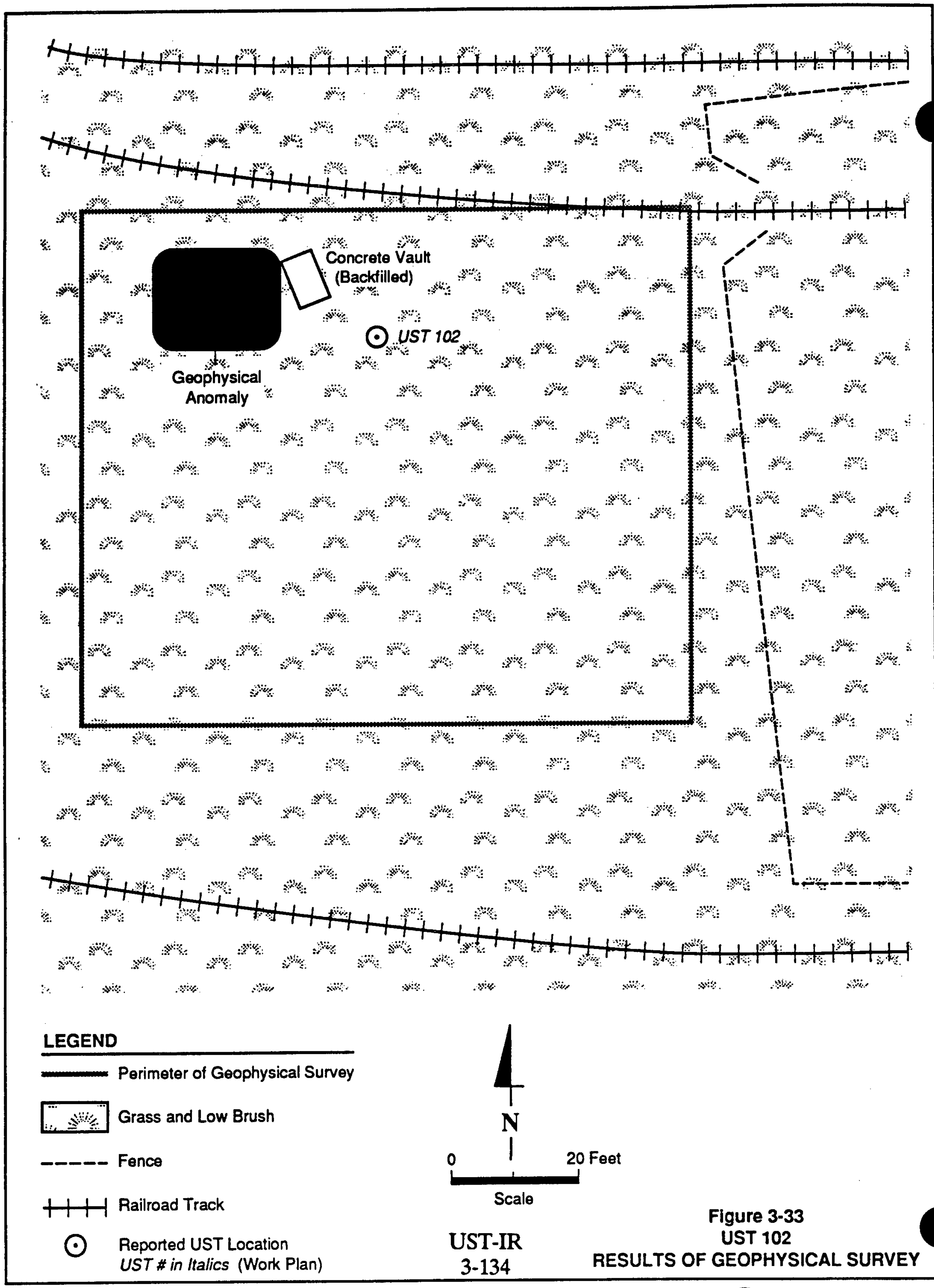


Figure 3-33
UST 102
RESULTS OF GEOPHYSICAL SURVEY

Figure 3-34 presents results for the BTEX and TVHC components of the active soil gas survey conducted at UST 102. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at some of the 29 sampled locations in the vicinity of UST 102. Ethylbenzene and xylene were not detected at this site. Benzene was detected in 19 samples, with concentrations ranging from 0.06 (which is slightly greater than the detection limit of 0.04 $\mu g/L$) to a maximum of 0.7 $\mu g/L$. Toluene was detected at 19 locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is at the detection limit of 0.1 $\mu g/L$) to a maximum of 20 $\mu g/L$. TVHCs were reported at 20 locations, with concentrations ranging from 0.3 (which is at the detection limit of 0.3 $\mu g/L$) to a maximum of 60 $\mu g/L$.

Most concentrations of volatiles reported at the site are low and are not considered to indicate significant, if any, contamination near the USTs. However, significant concentrations of toluene and TVHCs were reported for one sample location (SG-439) in the southeast corner. Surrounding soil gas samples contained only low (if any) levels of TVHCs, indicating that this relatively high level of potential contamination appears to be limited to a maximum of 25 feet in either direction and is not likely associated with the potential USTs. Slightly elevated concentrations of TVHCs along the eastern fence north of SG-439 may indicate a second potential contaminant source in the eastern portion of the survey area (i.e., samples SG-298 through SG-300).

Carbon dioxide was reported at 27 locations, with concentrations ranging from 660 (which is slightly greater than the detection limit of 310 $\mu g/L$) to a maximum of 1,900 $\mu g/L$ (Appendix D). Methane, with a detection limit of 680 $\mu g/L$, was not detected at the site.

As indicated in Table 3-4, low concentrations of four TCL BNAs were detected in soil samples collected near UST 102 (see Figure 3-32). Bis(2-ethylhexyl)phthalate was detected at 10 feet in STA-36 and at 2.5 feet in STA-37 and STA-38.

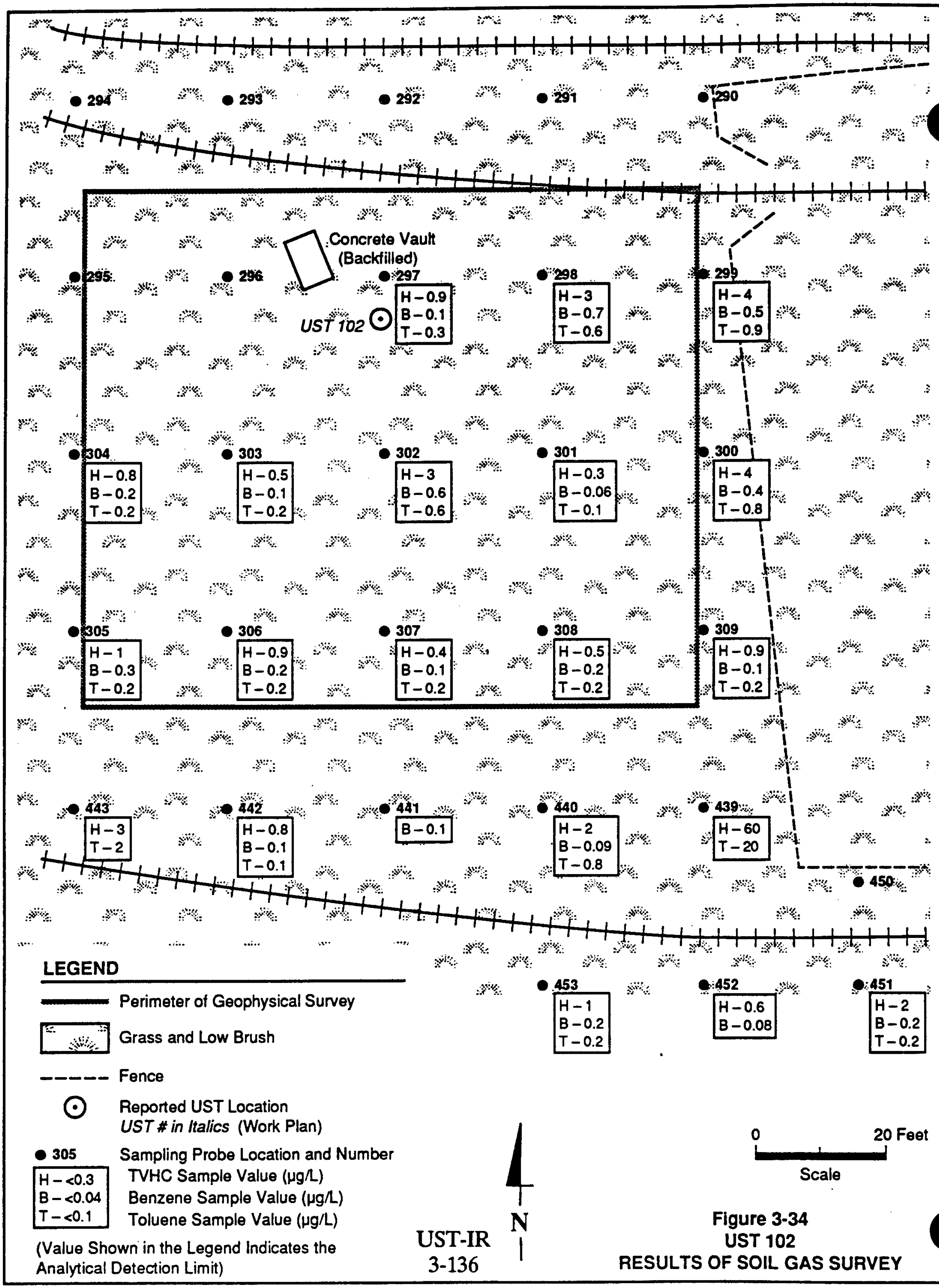


Figure 3-34
UST 102
RESULTS OF SOIL GAS SURVEY

Concentrations detected were 14 $\mu g/g$, 0.77 $\mu g/g$, and 0.83 $\mu g/g$, respectively. Fluoranthene, phenanthrene, and pyrene were detected only in the surface sample at STA-38, at concentrations of 0.09 $\mu g/g$, 0.04 $\mu g/g$, and 0.11 $\mu g/g$, respectively.

TPHCs were detected at concentrations of 35.5 $\mu g/g$ in the surface and 2.5-foot deep samples at STA-37, and at a concentration of 35.7 $\mu g/g$ in the sample collected from a depth of 7.5 feet at STA-38. No TCL VOAs were detected in any of the samples. One TCL VOA TIC and one unknown VOA TIC were detected in each of two soil samples. Based on these results, it does not appear that potential contamination due to a leaking tank is of concern.

3.49.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 7,600 square feet, indicate that one or two former USTs or other buried structures are likely to be present in the area reported to contain UST 102.

The chemical results of 29 active soil gas samples collected at the reported site indicate low concentrations of benzene, toluene, and TVHCs in all but one of the 20 samples containing detectable volatiles. Volatiles were not detected in soil gas samples collected closest to the potential tanks, which indicates that they likely did not leak sufficiently (if at all) to affect the environment. However, significant toluene and TVHC soil gas concentrations were reported for one sample location in the southeast corner of the survey area. The surrounding soil gas sample results indicate that this relatively high level of potential contamination is localized, but that lower levels of contamination may extend north along the fence in the eastern part of the survey area.

With the exception of the TVHCs and toluene concentrations reported for sample SG-439, the levels generally are low and would not typically be considered to indicate significant contamination. However, the ubiquitous presence of contaminants in all soil gas samples southeast of the tanks, the relatively high TVHC and toluene levels reported for SG-439, and the slightly elevated TVHC levels at several locations

(i.e., 4 $\mu g/L$ for SG-299 and SG-300) may indicate a potential areal source of soil contamination.

Soil samples collected in the vicinity of elevated soil gas TVHC and toluene levels exhibited only low concentrations of several TCL BNAs and TPHCs in limited locations. Based on these results, and because the low detected levels of organics do not appear to be associated with the buried USTs, no immediate action is recommended.

However, it is recommended that the area of the geophysical anomaly be excavated by UMDA to confirm the presence of the potential target. If abandoned USTs are discovered, the tanks should be placed under the UMDA tank closure program. The tanks should be removed and the surrounding soil tested and remediated, if necessary, according to State tank closure procedures.

3.50 Site 42, Former UST Locations (Administration Area)

3.50.1 Tank Description and Investigation

Current UMDA employees and installation records indicate that 10 USTs were formerly located in the Administration Area near the base gas station (Building 6) and north of the Oil/Fuel Transfer Station (Building 23) in the south-central portion of UMDA (see Plate 1). Four of the tanks (USTs 66 to 69) were located just west and south of the gas station--three to the north of the railroad tracks and one to the south of the tracks; these tanks contained various grades of gasoline. Six additional tanks (USTs 70 to 75) were located to the west of the Administration Area water tank--four tanks contained diesel fuel, and two were used to store stove oil. All 10 of the tanks were reportedly removed within the past 8 years, though the fill cap of UST 69 was discovered during the February 1992 field survey. UMDA employees recalled that the gasoline tank south of the railroad tracks (UST 69) was found to be leaking prior to removal, and other leaks--though neither reported nor observed--are possible. The age of the tanks at the time of removal was estimated by base personnel to be 40 years. There is no record of any cleanup activities following removal of the tanks.

The western portion of Site 42 is that area west of Building 9 and east of Oak Street. The eastern portion of Site 42, which is smaller, is east of Buildings 7 and 10 and west of Elm Street. Two active 1,000-gallon USTs containing diesel fuel (USTs 3 and 4) are located within or adjacent to the eastern portion of the site. These tanks have been in the ground for approximately 40 years. Additionally, an underground waste oil tank south of Building 10 (UST 45) was recently removed and disposed of off post in accordance with regulatory requirements.

Historic aerial photographs of the Administration Area were reviewed for surficial evidence of USTs in the vicinity of the water tower and the gas station. (Ground scarring--either light toned from bare soil or dead grass, or dark toned from wetness--is an indicator of USTs.) To assist in providing additional background data, the following information was interpreted from historic aerial photographs of the site area:

- 1949: There are a few objects on either side of the water tower, but there is no specific evidence of USTs. North of the water tower across Road D, however, is what appears to be a fill pipe demarcated by four corner posts. There is a similar signature just south of the gas station pumps (north of the rail spur).

- 1956: There is still no specific evidence of USTs on the east side of the water tower; however, two scars west of the tower may be fill pipes, and one scar west of the gas pumps may be where a tank was installed. The ground around the possible fill pipe north of the water tower is scarred; the possible fill pipe south of the gas pumps is

unclear, but there is a small scar (light area) there also.

- 1964: No significant changes are noted.
- 1965: There are four light spots on the pavement in the area where the possible fill pipe was noted south of the gas pumps in 1949. Otherwise, the area is unchanged.
- 1970: A few objects are evident in the open area west of the water tower. The scar north of the water tower is healing; the position of the previously seen possible fill pipe is unclear. The light spots near the gas pumps are still noticeable.
- 1971: There are light spots west of the water tower; one appears to be the termination of flow from a small building southwest of the water tower. The light spots remain near the gas pumps.
- 1972, 1977, 1980: The areas remain generally unchanged from their appearance in 1971.
- 1988 There is still no specific evidence of USTs. Across Road D from the water tower are five rectangular scars--previously described (1949) as possibly being a fill pipe. The light spots west of the water tower and near the gas pumps are no longer visible.

Although no evidence of the tanks was observed in these photographs, specific locations and details of nine of the USTs were shown on a 1941 construction drawing by Stevens and Koon (1941).

Because of the age of the tanks and their potential and reported leakage, active soil gas surveys were conducted in both the eastern and western portions of the site to evaluate potential source areas of volatiles soil contamination. Geophysical surveys were not conducted, because UMDA personnel stated that the tanks had been removed.

A total of 22 active soil gas samples were collected from the eastern portion of Site 42 (USTs 66 to 69). Thirty-seven active soil gas samples were collected from the western portion of Site 42. The samples were collected in a 25-foot rectangular grid around the former UST locations. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.50.2 Contamination Assessment

- Site 42 East--Figure 3-35 presents results for the BTEX and TVHC components of the active soil gas survey conducted in the eastern portion of Site 42. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene and toluene at several of the 22 sampled locations. Trace-to-low concentrations of TVHCs were reported at nine locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in five samples, with concentrations ranging from 0.04 (which is at the detection limit of 0.04 μg/L) to a maximum of 0.5 μg/L. Toluene was detected at five locations mostly coincident with benzene detections; it was reported at concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.1 μg/L) to a maximum of 1 μg/L. TVHCs were reported at eight of the locations, with most concentrations ranging from 0.5 (which is slightly greater than the detection limit of 0.4 μg/L) to 2 μg/L. The highest soil gas concentration of TVHCs--13 μg/L--was located at one sample location. Benzene and toluene were not detected in this sample, and

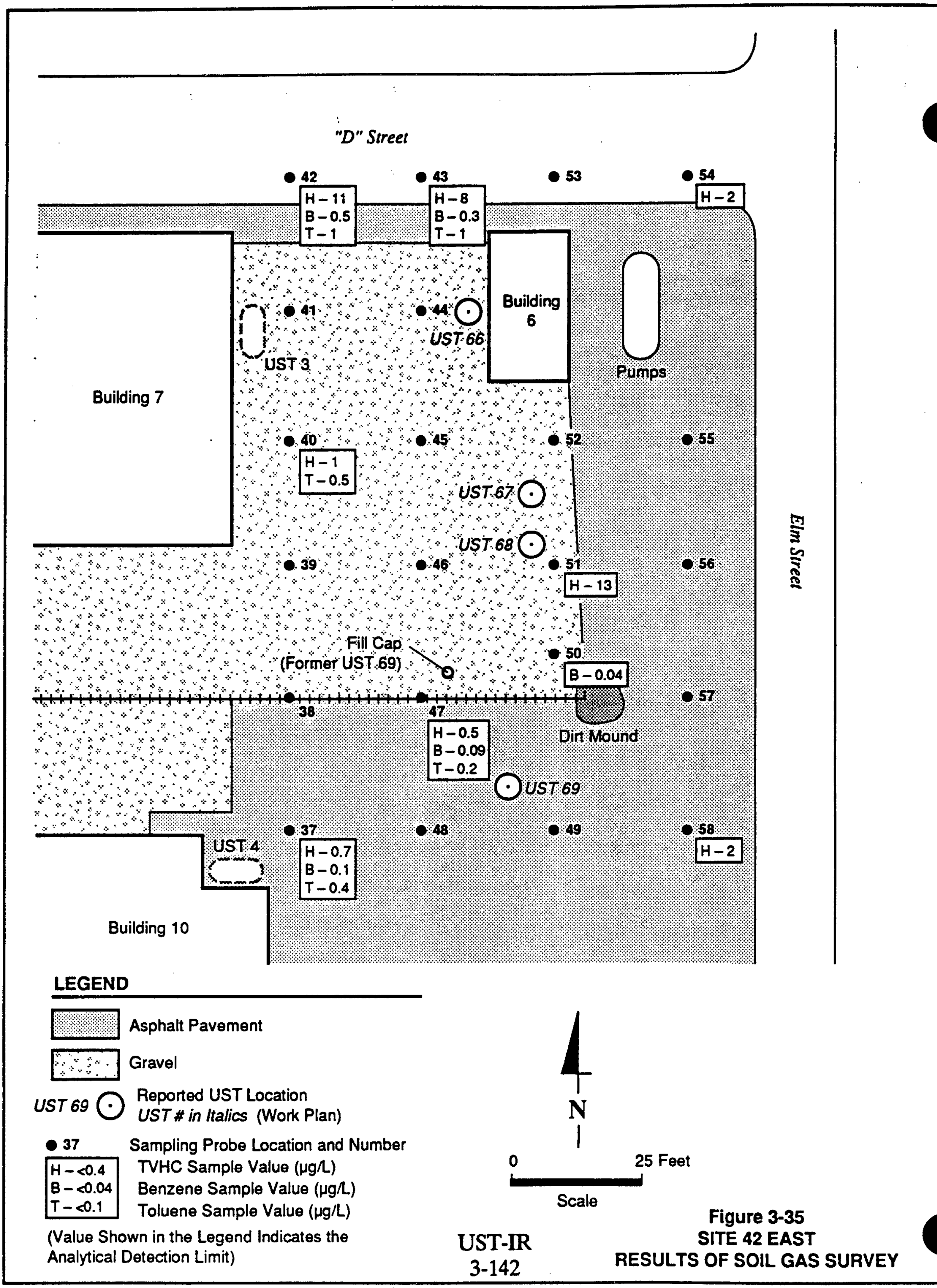


Figure 3-35
SITE 42 EAST
RESULTS OF SOIL GAS SURVEY

surrounding soil gas concentrations of TVHCs, benzene, and toluene were low, indicating little or no appreciable soil contamination. Low-to-moderate levels of TVHCs, benzene, and toluene reported for two northern Site 43 locations are likely the result of hydrocarbons associated with the D Street macadam surface and are not a concern.

Although detectable concentrations of volatiles were reported at the site, the concentrations are low and are not considered to indicate significant, if any, contamination. The reported volatiles were limited to a few discrete sample locations and do not exhibit a contiguous or consistent pattern typical of point sources of contamination such as a tank. The trace-to-low levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage in the gravel lot or asphalt constituents inadvertently introduced into the soil gas samples collected below the roadway.

Carbon dioxide was reported at 20 locations, with concentrations ranging from 700 (which is more than an order of magnitude greater than the detection limit of 60 μg/L) to a maximum of 32,000 μg/L (Appendix D). Although moderately elevated levels of carbon dioxide (14,000 μg/L) at SG-42 and SG-43 are associated with the near maximum levels of volatiles detected at this site, the remaining carbon dioxide levels do not correlate well with other volatiles concentrations and are at or below levels commonly reported for soil gas samples with no detectable volatiles. Methane, with a detection limit of 200 μg/L, was not detected at the site.

- Site 42 West--Figure 3-36 presents results for the BTEX and TVHC components of the active soil gas survey conducted in the western portion of Site 42. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, and TVHCs at

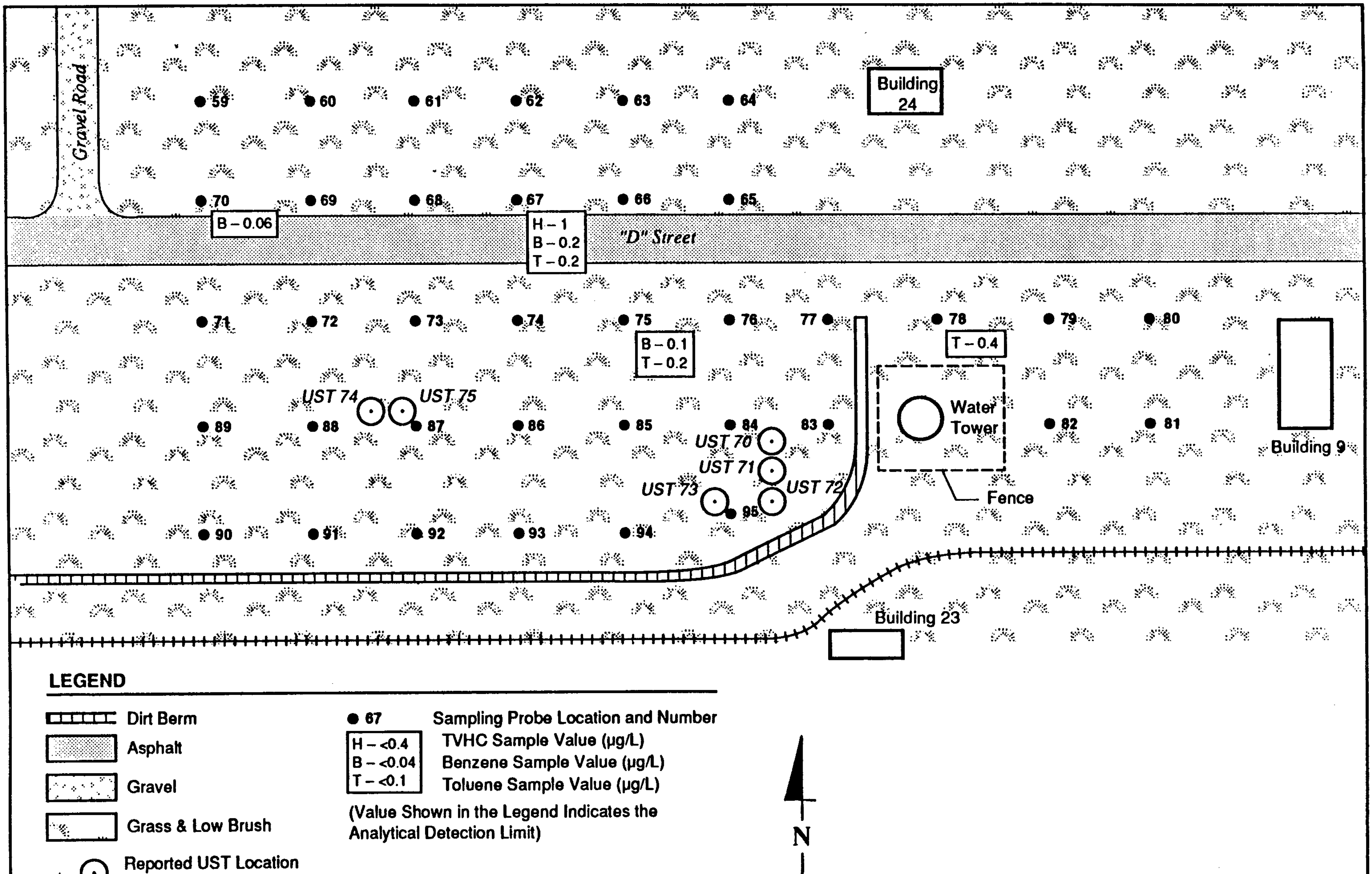


Figure 3-36
SITE 42 WEST
RESULTS OF SOIL GAS SURVEY

DAMES & MOORE

only a few of the 37 sampled locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in three samples, with concentrations ranging from 0.06 (which is at the detection limit of 0.06 $\mu g/L$) to a maximum of 0.2 $\mu g/L$. Toluene was detected at three locations mostly coincident with benzene detections; it was reported at concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.1 $\mu g/L$) to a maximum of 0.4 $\mu g/L$. TVHCs were reported at one location at a concentration of 1 $\mu g/L$ (which is slightly greater than the detection limit of 0.5 $\mu g/L$).

Although detectable concentrations of volatiles were reported at the site, the concentrations are low and are not considered to indicate significant, if any, contamination. The reported volatiles were limited to a few discrete sample locations and do not exhibit a contiguous or consistent pattern typical of point sources of contamination such as a tank. The trace levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage.

Carbon dioxide was reported at 32 locations, with concentrations ranging from 770 (which is slightly greater than the detection limit of 120 $\mu g/L$) to a maximum of 6,500 $\mu g/L$ (Appendix D). Carbon dioxide levels do not correlate well with volatiles concentrations. Methane, with detection limits ranging from 160 to 1,600 $\mu g/L$, was not detected at the site.

3.50.3 Conclusions and Recommendations

The chemical results of 59 soil gas samples collected from the eastern and western portions of Site 42 indicate only trace concentrations of benzene and toluene at only a few discrete sample locations. Trace levels of TVHCs were detected in one sample from the western portion of the site. Trace-to-low concentrations of TVHCs were reported for nine locations in the eastern portion of Site 42. However, the low levels and limited occurrence of these analytes are not considered to be of concern,

and may reflect local surface spillage of oil or fuel, or indicate that tanks located here did not leak sufficient quantities (if at all) to affect the environment.

Because the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at Site 42.

3.51 Site 43, Former Gas Station/Possible UST Location (Central UMDA Grounds)

3.51.1 Tank Description and Investigation

A gasoline station was once located in the central portion of UMDA, at the intersection of Rim and Center Roads (see Plate 2, Area VII). A current UMDA employee recalled that four 3,000-gallon underground gasoline or diesel tanks (USTs 59 through 62) were formerly located at this site. No records or other information was available regarding the existence or removal of USTs at this location. There was no evidence of any USTs at this site during the Enhanced PA (Dames & Moore, 1990a) or the February 1992 Dames & Moore site visits.

Historic aerial photographs of the gas station area were reviewed for surficial evidence of USTs in the vicinity of Rim and Center Roads. (Ground scarring--either light toned from bare soil or dead grass, or dark toned from wetness--is an indicator of USTs.) To assist in providing additional background data, the following information was interpreted from historic aerial photographs of the site area:

- 1949: A loop road off of Rim Road leads to the west end of a narrow, low oblong east-west oriented structure (which appears to be an AST); on the other side of the loop road, at the west end of the structure, a small object (possibly a gas pump) casts a shadow. Two slightly larger objects are located north and south of the east end of the structure. Just east of this site is a field that has been graded and is revegetating.

- 1950: The arc-shaped area within the loop road west of the structure has been graded, and there is an object the size of a vehicle in the center of the graded area. The possible gas pump is not apparent in the shadow of the structure, and it is not clear whether it is still present. The shape of the structure also appears to have changed.

- 1956: The vehicle-sized object in the graded area (noted in the 1950 photographs) is gone. The area apparently has been paved with macadam. The structure has a new, wider roofline, especially on its west end. There is a small, dark rectangular area on the ground both in the loop road and where the possible gas pump was visible in 1949 (this is approximately where the shape of a gas island was visible in the macadam during the 1989 site visit). The object near the southeast corner of the structure appears to have been relocated approximately 25 feet south of where it had been in previous years.

- 1958: The gas station is gone. There are ground scars where the building and objects to the east had been located; the shape of the gas island is barely evident in the paved area. No other ground scars suggest that any USTs or underground piping was removed.

- 1964: The ground scars have almost completely revegetated, and dirt roads to the site have deteriorated. The paved area is still visible.

- 1968: The ground in the site area--both the paved area and the graded area to the east--is much darker than the

surrounding soil. What appear to be two poles or short towers occur north and south of the apparent gas island.

- 1970: The paved area appears to be lighter in tone than the graded area; the poles/towers are no longer apparent.
- 1971: There is a small structure, about the size of a "sunshade," south of the apparent gas island.
- 1972: Two pairs of light-toned objects are evident north of the apparent gas island; the small structure to the south is no longer evident.
- 1977: There appear to be north-south striations in the macadam near Rim Road, but the apparent gas island is still visible. The objects are no longer visible.
- 1980-1988: No changes are apparent.

The review of historic aerial photographs, site visits, and interviews with former UMDA employees were inconclusive concerning the presence or removal of USTs at this site.

Because it was unknown whether these USTs existed and were removed or abandoned in place, a geophysical survey was conducted to locate the tanks in the event that they were abandoned and remained underground at the site. The geophysical survey was conducted around the reported UST locations within a 200- by 200-foot rectangular area. Surface magnetic and EM conductivity data were collected at 10-foot intervals and digitally recorded in the field. The geophysical data were processed, plotted, and contoured to define anomalous regions of magnetism and EM conductivity.

After the geophysical survey was completed, an active soil gas survey was conducted within the same approximate area to evaluate potential source areas of volatiles soil contamination in the event that the tanks (if they existed) had leaked but

had been removed. A total of 25 active soil gas samples were collected in a 50-foot rectangular grid around the reported location of USTs 59 to 62. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane.

3.51.2 Contamination Assessment

Figure 3-37 shows the reported locations of USTs 59 to 62 and summarizes the results of the geophysical survey. Detailed survey summaries and contour maps of the geophysical data are presented in Appendix C. The results of the survey indicate that it is unlikely that USTs are present within the surveyed area. Several small and weak magnetic anomalies were observed, but they are not considered to be USTs because of their size and strength and because they could not be confirmed by the EM data. The anomalies were attributed to local utilities. Several areas of stressed vegetation were observed during the survey--in particular, one large area east of the asphalt lot. Although the areas may represent the remains of past excavation and grading activities conducted as part of the gas station demolition, the causes of the stressed vegetation are presently unknown.

Figure 3-38 presents results for the BTEX and TVHC components of the active soil gas survey conducted at Site 43. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. The soil gas survey results indicate trace levels of benzene, toluene, xylene, and TVHCs at some of the 25 sampled locations. Ethylbenzene was not detected at this site. Benzene was detected in six samples, with concentrations ranging from 0.04 (which is slightly greater than the detection limit of 0.009 μg/L) to a maximum of 0.2 μg/L. Toluene was detected at four locations coincident with benzene detections; it was reported at concentrations ranging from 0.1 (which is at the detection limit of 0.1 μg/L) to a maximum of 0.3 μg/L. Xylene was detected at two locations coincident with TVHC detections, at concentrations of 2 μg/L and 3 μg/L. TVHCs were reported at five locations, with concentrations ranging from 0.4 (which is slightly greater than the detection limit of 0.4 μg/L) to a maximum of 3 μg/L.

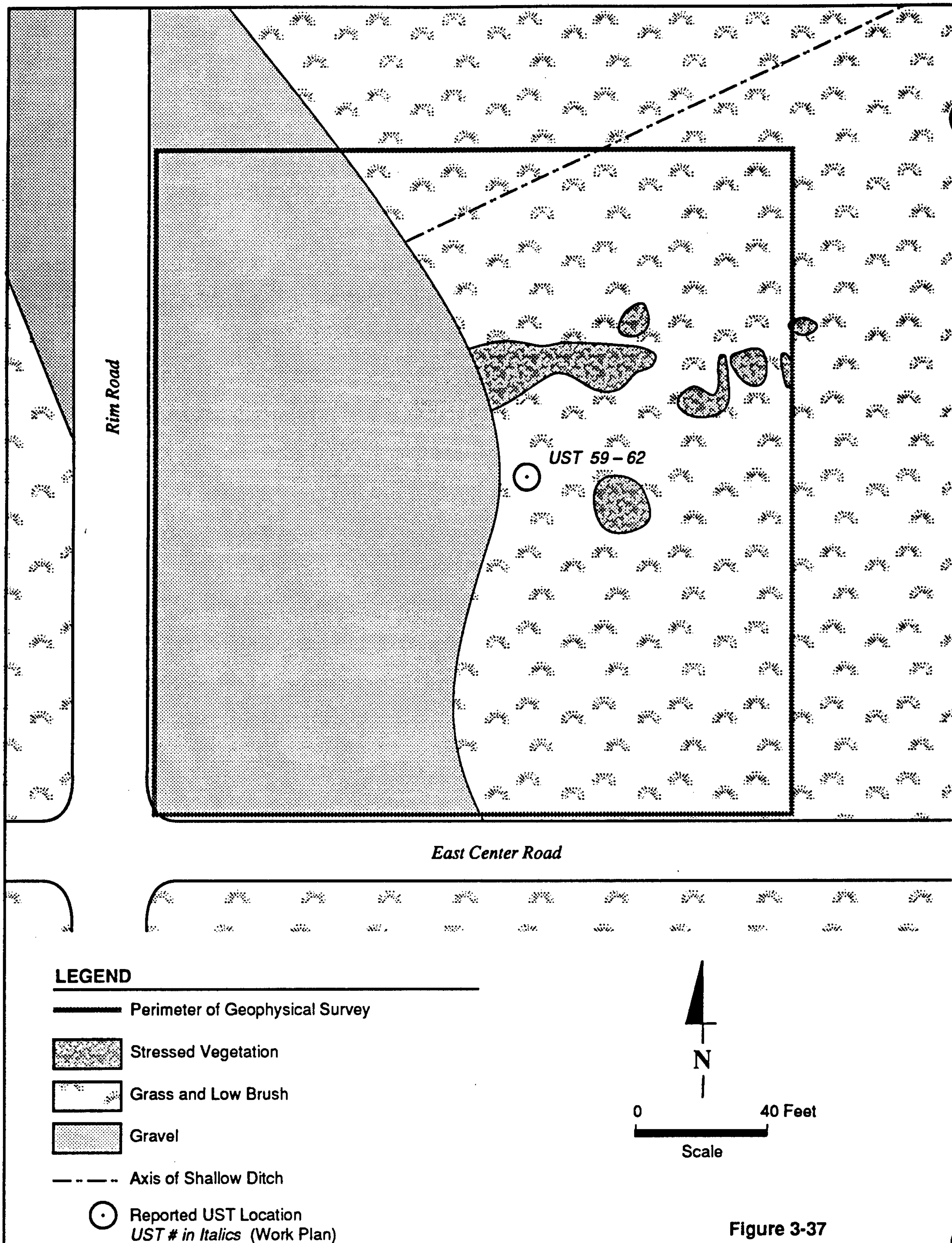
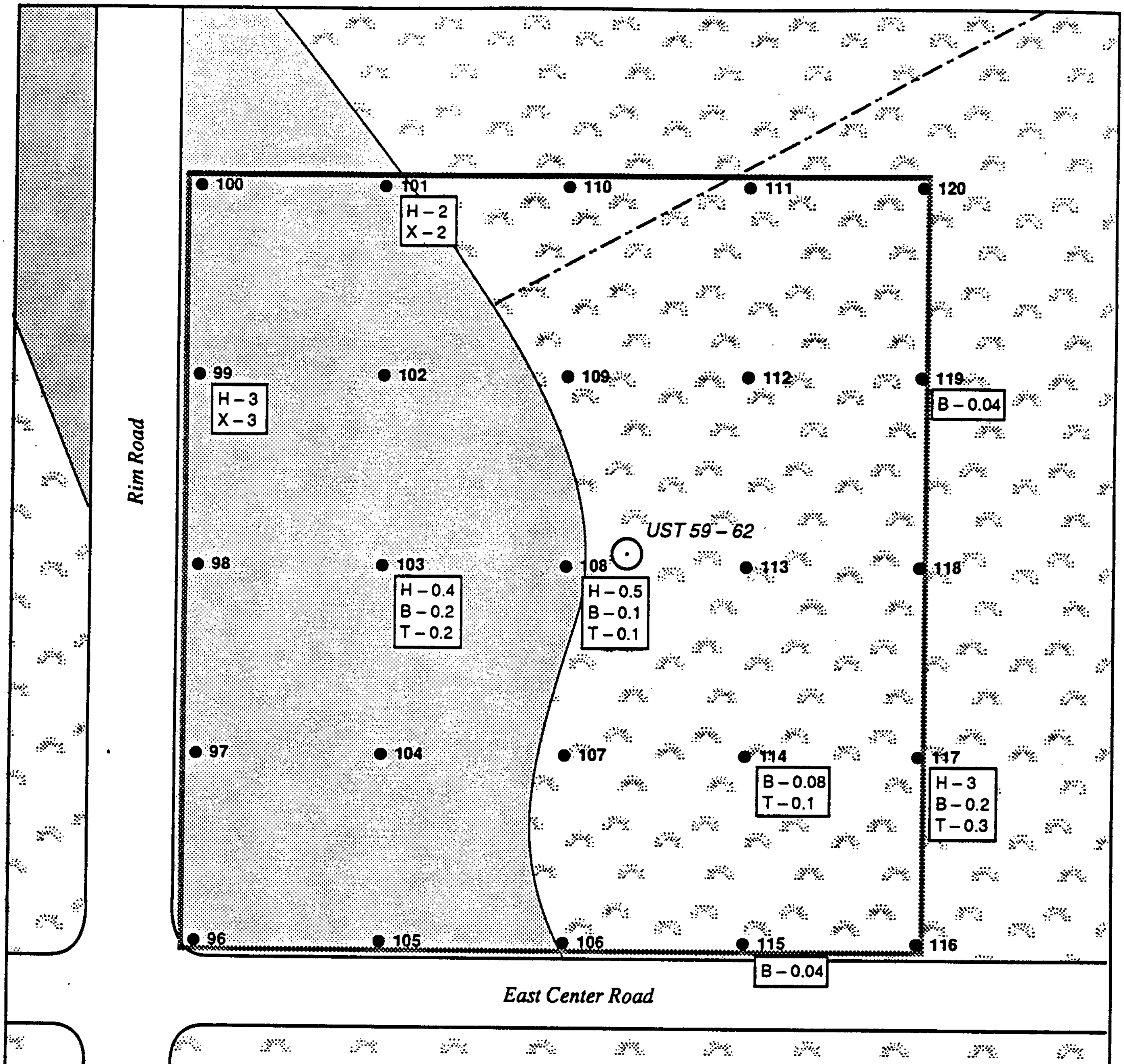


Figure 3-37
SITE 43, FORMER GAS STATION
RESULTS OF GEOPHYSICAL SURVEY



LEGEND

Perimeter of Geophysical Survey

Grass and Low Brush

Gravel

Axis of Shallow Ditch

Reported UST Location – *UST # in Italics* (Work Plan)

● 103 Sampling Probe Location and Number

H – <0.3	TVHC Sample Value (µg/L)
B – <0.04	Benzene Sample Value (µg/L)
T – <0.1	Toluene Sample Value (µg/L)
X – <0.3	Xylenes Sample Value (µg/L)

(Value Shown in the Legend Indicates the Analytical Detection Limit)

N

0 40 Feet

Scale

Figure 3-38
SITE 43, FORMER GAS STATION
RESULTS OF SOIL GAS SURVEY

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Although detectable concentrations of volatiles were reported at the site, the concentrations are low and are not considered to indicate significant, if any, contamination. These and other volatiles concentrations do not exhibit a consistent pattern typical of point sources of contamination such as tanks. The trace levels of volatiles are not considered to be of concern and may indicate minor contamination from localized surface spillage or the inadvertent introduction of asphalt constituents into samples collected below or near the asphalt lot and roadway.

Carbon dioxide was reported at all locations, with concentrations ranging from 1,700 to a maximum of 13,000 μg/L (Appendix D). These levels do not correlate well with detectable levels of volatiles. Methane, with a detection limit of 1,000 μg/L, was not detected at the site.

3.51.3 Conclusions and Recommendations

The results of the geophysical survey, which covered approximately 40,000 square feet, indicate that USTs are unlikely to be in the area reported to contain USTs 59 to 62. However, data from the geophysical survey do not indicate whether the tanks had been located here and were removed.

The chemical results of 25 active soil gas samples collected at the reported site indicate only trace concentrations of benzene, toluene, xylene, and TVHCs at limited locations within the area surveyed. The trace levels and limited occurrence of these analytes are not considered to be of concern, and indicate that--if the tanks were present--they did not leak sufficient quantities (if at all) to affect the environment.

Because the geophysical survey indicates that USTs are unlikely to be present and the soil gas survey results indicate limited and trace levels of soil contamination, no further action is recommended at this site.

3.52 Site 73, Diesel Fuel Spill Location

3.52.1 Tank Description and Investigation

This site is located to the north of Building 6 (gas station) in the Administration Area (see Plate 1). USTs 42 and 43 are presently located beneath a concrete pad. The tanks are used to supply fuel pumps (at Building 6) used for UMDA vehicles. During the January 1990 Dames & Moore site visit, former UMDA employees reported that a spill of approximately 800 gallons of diesel fuel occurred in 1955 on soil in the area that is now covered by the concrete pad. No other information is available regarding the nature and extent of the spill or the cleanup activity. However, the collection of free liquid and the excavation of some surface soil are expected to have occurred earlier to facilitate installation of the concrete pad and to eliminate fire hazards associated with a diesel fuel spill of this magnitude. Additionally, an 800-gallon diesel fuel tank (UST 65) was reported to be located west of the area containing USTs 42 and 43.

To assist in providing additional background data, the following information was interpreted from historic aerial photographs of the site area:

- 1949: The site contains what appears to be a small building on a concrete pad and some open storage.
- 1956: The site contains a rectangular area of bare soil that is generally lighter in tone than its surroundings. This bare soil could be the result of tank installation or vegetation destruction by a spill-and-mopup operation. The periphery of the light area is occupied by several vehicle-sized objects; most of these objects appear to be vehicles, but one appears to be an AST.
- 1958: Although the site appears to have revegetated and blends in with its surroundings, the outline of the former bare area can still be discerned. One of the objects seen

in 1956 is still apparent, but its position has changed from the east side to the north side of the site.

- 1964-1965: The site appears to have completely revegetated, though there is still a light-toned area under the grass. A darker soil area--possibly a stain--is evident near D Street, but it is difficult to separate from the stains all along the road in front of the gas station, where it appears that vehicles have picked up petroleum products on their tires.
- 1970-1972: The site blends into its surroundings; numerous vehicles and objects are in open storage around the site periphery, though the number decreases through the years.
- 1977: Objects or vehicles appear to occupy the site; the soil between the site and the motor pool building appears to be darkly stained.
- 1980: The site is similar in appearance to what it was in the early 1970s.
- 1988: A fenced concrete pad occupies the site. The pad is empty, but there are a few objects within the fenced area.

An active soil gas survey was conducted at the site to evaluate potential source areas of volatiles soil contamination. Although previous remedial activities (i.e., excavation of contaminated soil) may have occurred, there is no supporting documentation. Therefore, the purpose of the soil gas investigation was to determine whether there is contamination from the reported spill incident. In addition, the soil gas survey was conducted because the exact location of the former spill and the possible extent of any contaminant migration from the spill area are not known. The

sampling also addressed the area reported to contain UST 65; although a geophysical survey did not indicate the presence of a tank in this area (see Section 3.3), the active soil gas survey was performed to evaluate potential source areas of volatiles soil contamination in the event that the tank was removed and had leaked.

A total of 57 active soil gas samples were collected at Site 73. Initially, 36 samples were collected around USTs 42 and 43, the area that included UST 65 and was reported to have been affected by the spill. After detecting a significant concentration of TVHCs at SG-24, 21 additional samples were collected to define the western boundaries of potential soil contamination. The samples were collected in a 25-foot rectangular grid in the vicinity of the spill area. Soil gas was extracted from a depth of 3 feet and analyzed for BTEX, TVHCs, carbon dioxide, and methane. Based on the soil gas results, soil samples were collected from three 10-foot borings (S73-1 through S73-3) in the areas reported to have elevated TVHC concentrations. In borings S73-1 and S73-2, soil samples were collected at the surface and at depths of 2.5, 5, and 10 feet. In boring S73-3, samples were collected at the surface and at depths of 2.5, 5, 7.5, and 10 feet. All samples were chemically analyzed for TCL VOAs, TCL BNAs, and TPHCs. Approximate sample locations are shown in Figure 3-39.

3.52.2 <u>Contamination Assessment</u>

Figure 3-40 presents results for the BTEX and TVHC components of the active soil gas survey conducted at Site 73. Results of the carbon dioxide and methane components of the survey are presented in Appendix D. Soil gas survey results indicate trace levels of benzene and toluene at some of the 57 sampled locations. Low-to-moderate concentrations of TVHCs were reported at 28 locations. Ethylbenzene and xylene were not detected at this site. Benzene was detected in 18 samples, with concentrations ranging from 0.04 (which is at the detection limit of 0.04 μg/L) to a maximum of 0.9 μg/L. Toluene was detected at 23 locations mostly coincident with benzene detections; it was reported at concentrations ranging from 0.09 (which is at the detection limit of 0.09 μg/L) to a maximum of 1 μg/L. TVHCs

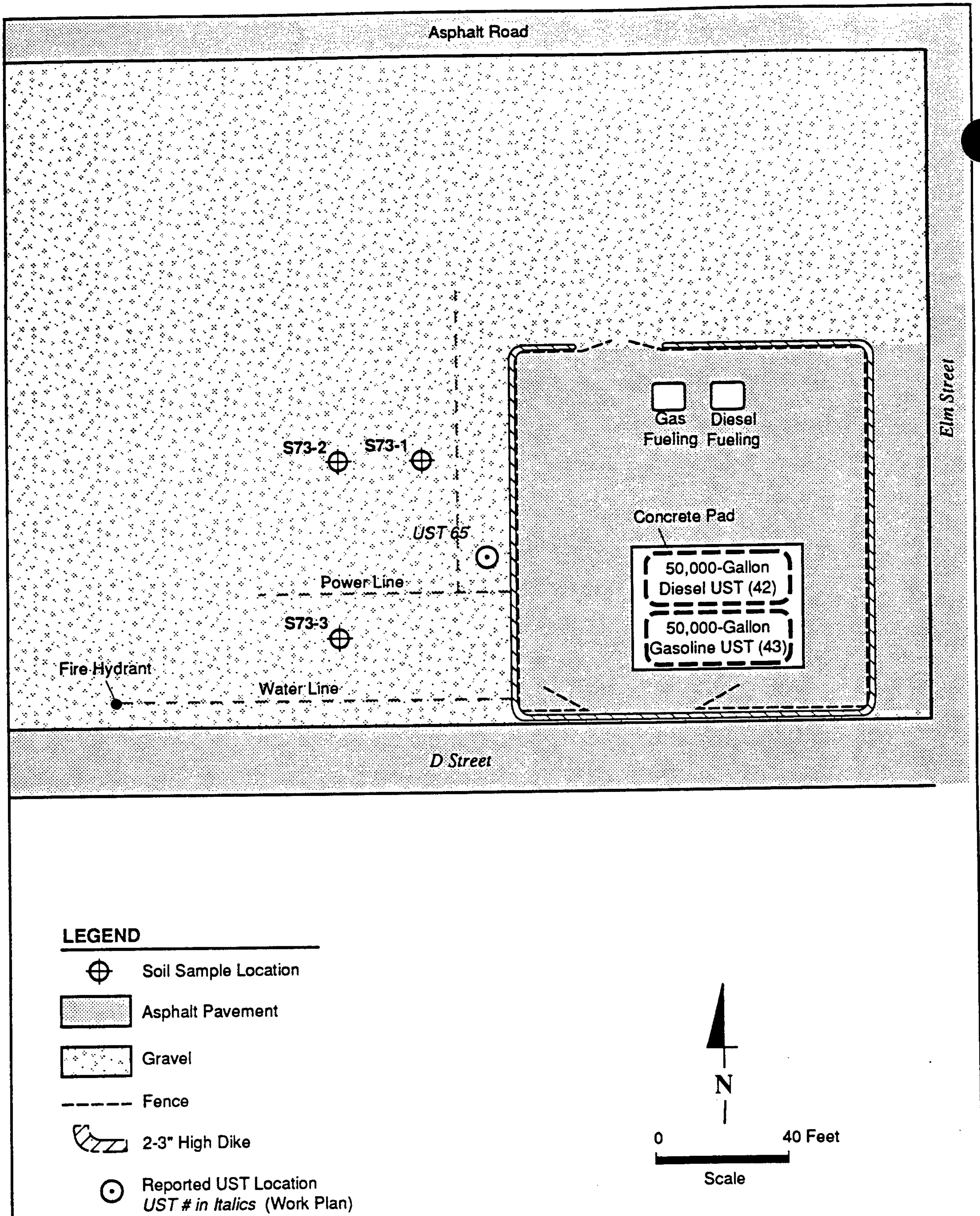
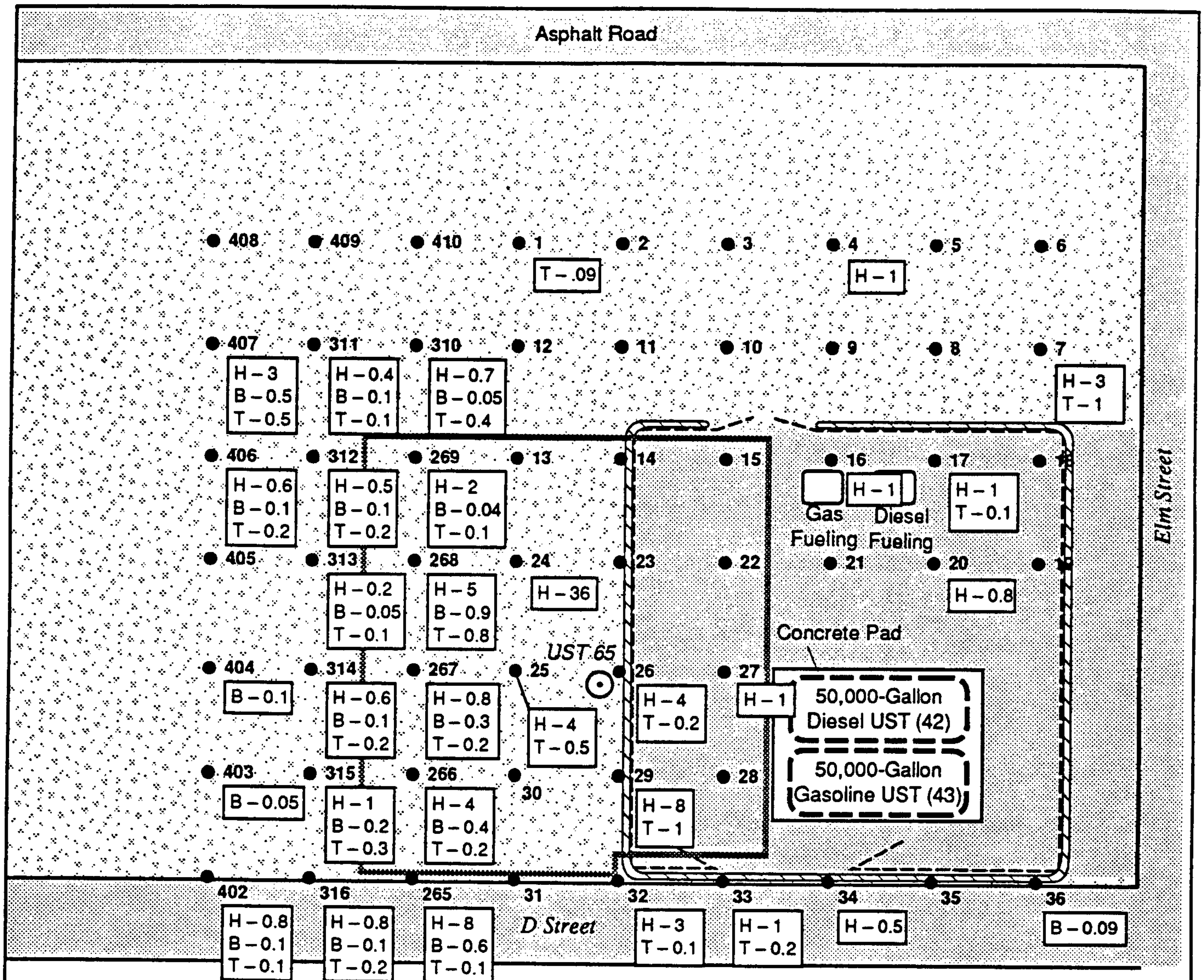
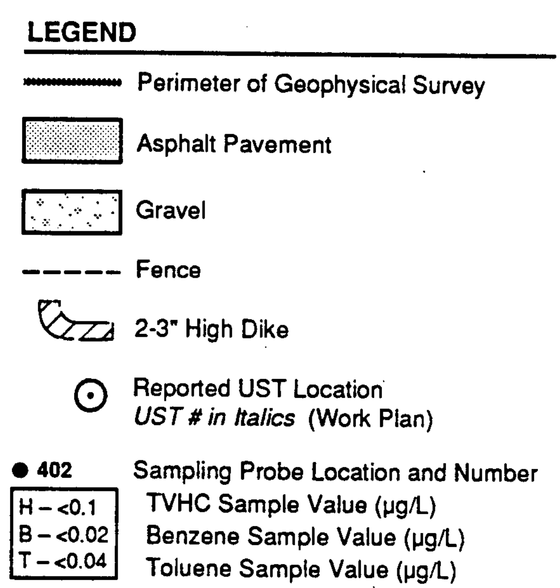


Figure 3-39
SITE 73
DIESEL FUEL SPILL LOCATION
SOIL SAMPLE LOCATIONS





(Value Shown in the Legend Indicates the Analytical Detection Limit)

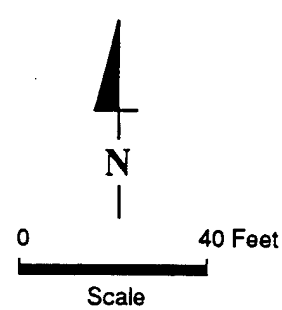


Figure 3-40
SITE 73
DIESEL FUEL SPILL LOCATION
RESULTS OF SOIL GAS SURVEY

were reported at 28 locations, with concentrations ranging from 0.2 (which is slightly greater than the detection limit of 0.1 μg/L) to a maximum of 36 μg/L.

Although concentrations of volatiles detected at the site generally are low and would not typically be considered to indicate significant contamination, the ubiquitous presence of the volatiles and the relatively high concentrations of TVHCs at several locations may indicate significant soil contamination at the site. The elevated levels of TVHCs at SG-24 (36 μg/L), SG-268 (5 μg/L), SG-25/SG-266 (4 μg/L), and SG-265 (8 μg/L) indicate potentially significant soil contamination west and southwest of USTs 42 and 43.

Carbon dioxide was reported at 54 locations, with concentrations ranging from 530 to a maximum of 50,000 μg/L (Appendix D). Methane, with a detection limit of 100 μg/L, was not detected at the site. Although several of the higher concentrations of carbon dioxide were not associated with the presence of detectable volatiles, the majority of the high levels were reported for samples collected within the fenced and paved area near USTs 42 and 43, which indicates a well defined area of elevated carbon dioxide in the surficial soil gas. It is uncertain whether these levels are the result of greater carbon dioxide gas production or the attenuation of trapped gases by the less permeable concrete and asphalt. However, only trace concentrations of TVHCs were detected beneath the paved area around the active tanks, which indicates that attenuation of the carbon dioxide gases is likely a dominant mechanism contributing to this distribution of carbon dioxide.

As indicated in Table 3-4, only one TCL VOA--chloroform--was detected in one soil sample (S73-3), at a very low concentration (0.001 μg/g; see Figure 3-39). One VOA TIC was detected in each of three soil samples, also at very low concentrations. No TCL BNAs were detected in any samples. Low-to-moderate levels of TPHCs were detected in some of the samples collected from borings S73-1 and S73-2. In S73-1, a moderate TPHC concentration of 804 μg/g was detected at the surface, with decreasing concentrations of 79.9 μg/g and 39.1 μg/g detected at depths of 2.5 and 5 feet, respectively. No TPHCs were detected at the 10-foot depth. In S73-2, a level

of 38.0 μg/g TPHCs was detected at the surface, and 37.3 μg/g were detected at 5 feet. No TPHCs were detected at the 2.5- and 10-foot depths. These results indicate that TPHC contamination may be due to surficial spills, not a leaking tank, because levels decreased with depth. A PID reading of 22.8 ppm was detected at the surface (but under asphalt) in boring S73-1.

3.52.3 Conclusions and Recommendations

With the exception of TVHC concentrations reported for four sample locations, the BTEX and TVHC soil gas concentrations generally are low and would not typically be considered to indicate significant contamination. However, the ubiquitous presence of BTEX at the site and the moderate TVHC levels reported for SG-24 (36 μg/L) and other locations (i.e., 8 μg/L for SG-29 and SG-265; 5 μg/L for SG-268) indicate soil contamination. The elevated levels of TVHCs were limited to several locations west of USTs 42 and 43, which may reflect residual soil contamination from the 1955 spill (UST 65) or other incidents associated with site operations. However, the results may also indicate spillage or leakage from vehicles or other site operations.

No TCL BNAs were detected in soil samples, and only one TCL VOC was detected in one soil sample at a very low concentration. TPHC concentrations in boring S73-2 were low to moderate, and the TPHC concentrations in S73-1 decreased significantly with depth, indicating a previous surface spill.

Based on results of the soil gas survey and soil sampling, it is recommended that the soil in the area west of USTs 42 and 43 be remediated. No further action is recommended for the USTs. However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the continued integrity of the tanks and to identify potential leaks.

3.53 Site 74, Oil/Fuel Transfer Station (Building 23)

3.53.1 Tank Description and Investigation

As reported to Dames & Moore during the January 1990 site visit for the Enhanced PA (Dames & Moore, 1990a), Building 23 and the surrounding areas have been used to transfer oil and fuel from incoming railcars to UMDA vehicles or storage tanks (see Plate 1). Former UMDA employees expect that, since the early 1940s, spills of these materials most likely occurred on the soil to the west and south of Building 23, near the railroad tracks and near an oil transfer fill pipe located east of the building. Presently, there are no signs of soil staining in this area. A current UMDA employee reported to Dames & Moore during the October 1990 site visit that spills, leaks, and overflows of diesel and other fuels occurred from USTs located north of this site. However, results of a soil gas survey conducted at Site 42 indicated no significant volatiles soil contamination from former USTs located north of the transfer station.

To assist in providing additional background data, the following information was interpreted from historic aerial photographs of the site area:

- 1949: Building 23 is evident, and a triangular area of soil at the west end of the building appears to be stained. Drum storage is evident in the fenced yard, just south of the railroad tracks.

- 1956: What appears to be a reflective substance occurs along the track next to Building 23, from west of the administration area to a spot halfway between Buildings 23 and 10. The dark-toned area west of Building 23 is not as apparent as in 1949. A light-toned area, where the vegetation appears to have been killed, occurs southeast of the building, across the track. Drum storage is still evident in the fenced yard.

- 1958: What appears to be a small vehicle is parked west of Building 23. Light-toned areas are adjacent to the east side of the building and in a narrow strip along the south side of the track across from the building. Railcars are evident on the tracks north and east of Building 23, and it appears that the track adjacent to the building has a darker tone than nearby tracks. Drum storage is still evident in the fenced yard.
- 1964: No significant changes are apparent onsite.
- 1965: The soil onsite generally blends with surrounding areas; no other changes are apparent.
- 1970: A large area south of the track appears to be stained with road oil or another dark substance; no other changes are apparent.
- 1971-1972: A small area south of the track is still darkly stained; no other changes are apparent.
- 1977: The very dark stains are no longer evident. Dark-toned soil occurs under the tracks between Buildings 23 and 10. A new light-toned area is apparent southeast of Building 23, across the track. Drum storage is still evident in the fenced yard.
- 1980: The light-toned area is no longer evident. The dark-toned soil under the tracks is not as dark as in 1977. Drum storage is still evident in the fenced yard.
- 1988: A light-toned area is again apparent along the south side of the track; no other changes are apparent.

The site consists of several areas, each with a different history. The majority of the site houses a small railroad yard south of Building 23, where various oil and fuel products were transferred to tankers or storage tanks. Also, Dames & Moore was informed that an area south of the water tower and adjacent to Site 74, on the north, was likely to be contaminated by overflow from USTs that were located west of the water tower (i.e., Site 42). Because this potentially contaminated soil may overlap the Site 74 boundary, this discussion addresses both of these areas.

Various types of oil and fuel were transferred from railcars to vehicles or storage tanks over a period of 50 years. Although some spillage is likely to have occurred during this time, the exact locations of former spills (if any) were unknown. Therefore, a passive soil gas survey was performed to evaluate the presence of contamination and to help identify former spill locations. This survey was used as an initial qualitative tool to identify areas that may require additional investigation. Unlike the other UST sites, a passive soil gas survey was recommended because the Site 74 soil consists of loose gravel in a rail roadbed. An active survey would be expected to disturb the loose gravel and subsurface gases, thereby volatilizing and dissipating potential contaminants prior to sample collection.

As shown in Figure 3-41, a total of 36 passive soil gas samples were collected in the area potentially impacted by the activities near the transfer station. The samples were collected in a 50-foot rectangular grid. Soil gas was collected from a depth of 1 foot and analyzed for relative ion counts of total BTEX, PCE, and TCE. The ion counts represent relative and semiquantitative analyte concentrations of soil vapor collected over a period of 7 days and do not necessarily correspond directly to mass per unit volume measurements (see Section 2.5).

Based on the passive soil gas results, soil samples were collected from three 10-foot borings (S74-1 through S74-3) in the areas reported to have elevated VOC concentrations. Boring locations are shown in Figure 3-42. Samples were collected

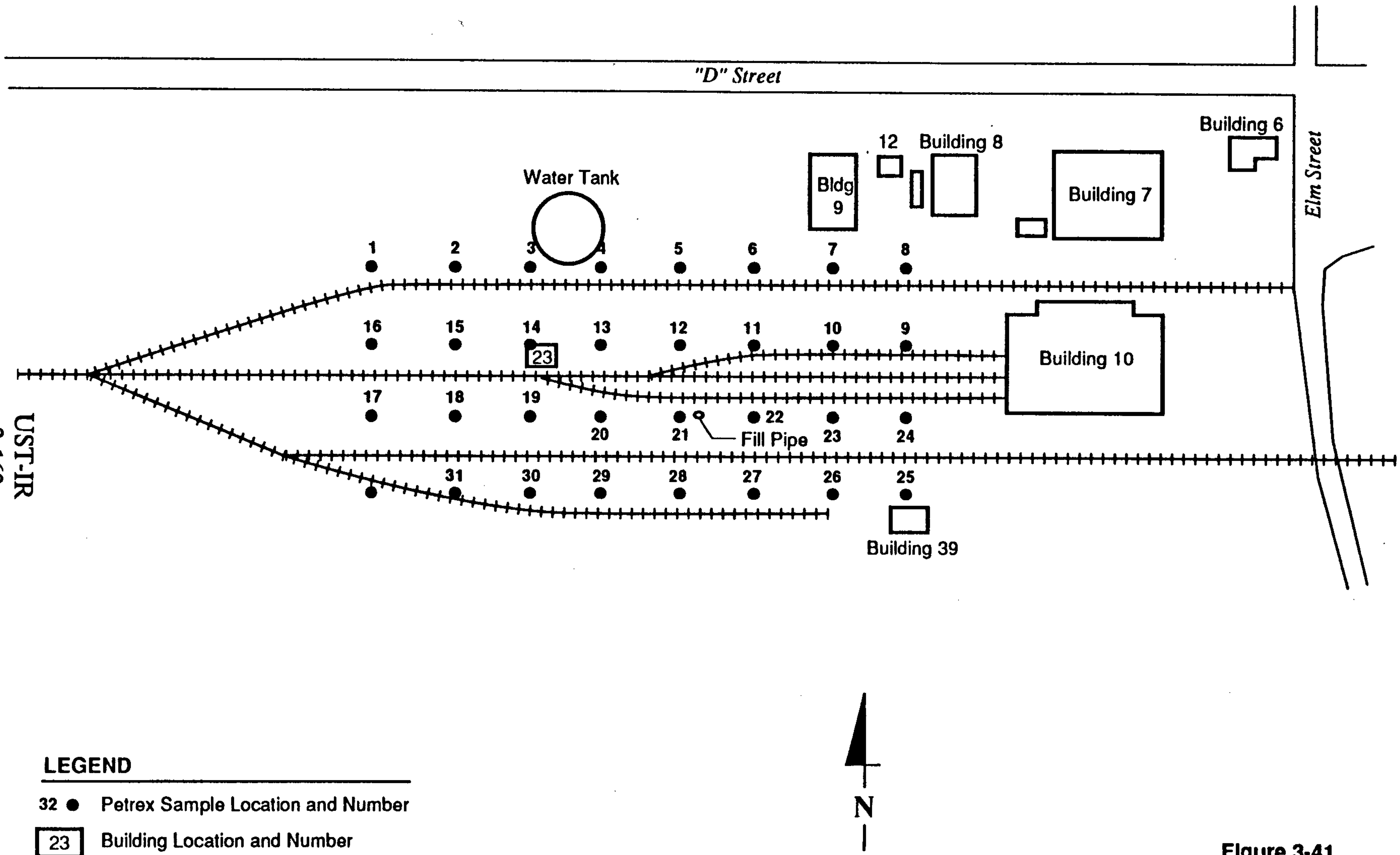


Figure 3-41
SITE 74
OIL/FUEL TRANSFER STATION
SOIL GAS SAMPLE LOCATIONS

DAMES & MOORE

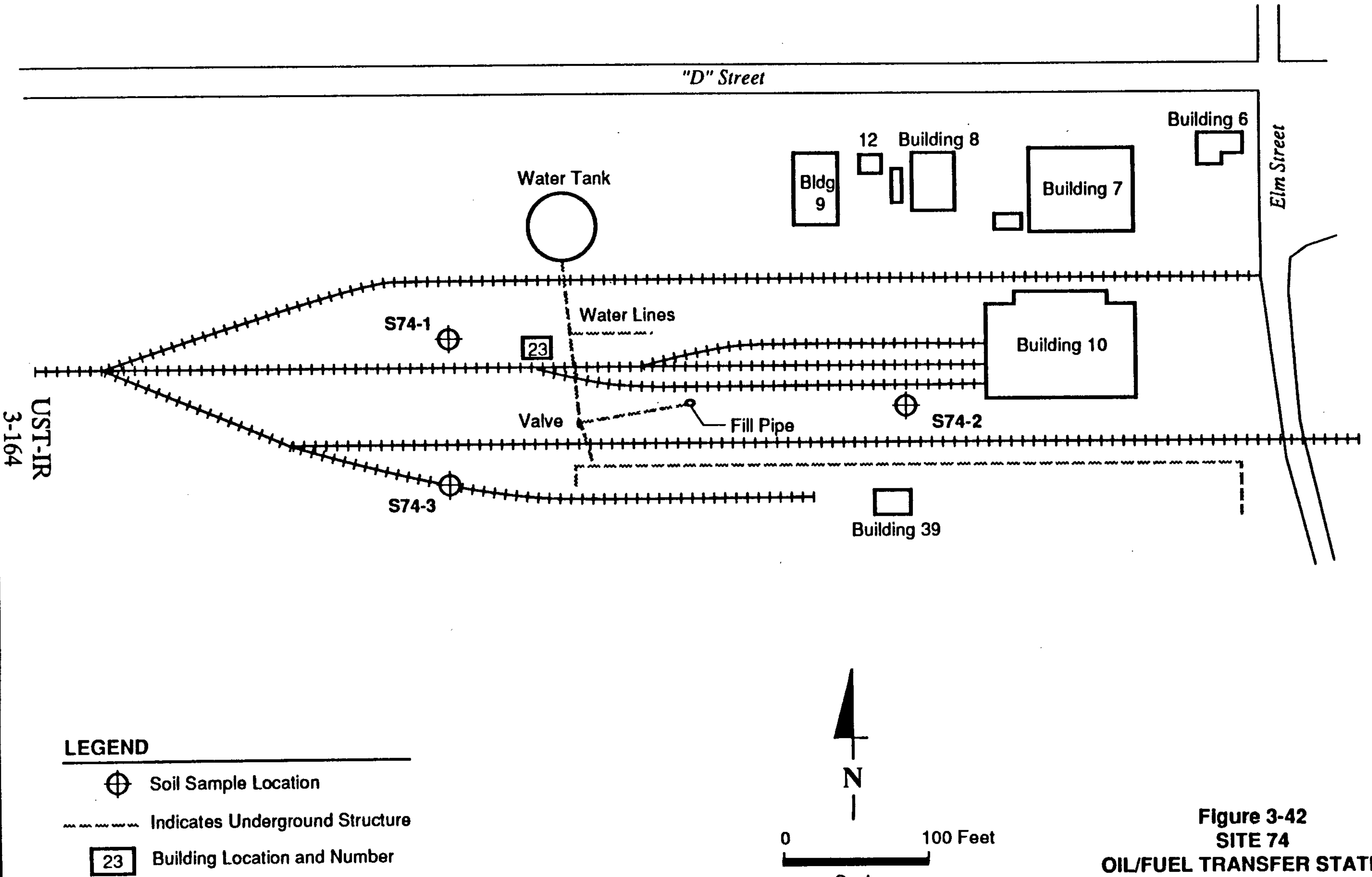


Figure 3-42
SITE 74
OIL/FUEL TRANSFER STATION
SOIL SAMPLE LOCATIONS

at the surface and at depths of 2.5, 5, 7.5, and 10 feet in all three borings. All samples were chemically analyzed for TCL VOAs, TCL BNAs, and TPHCs.

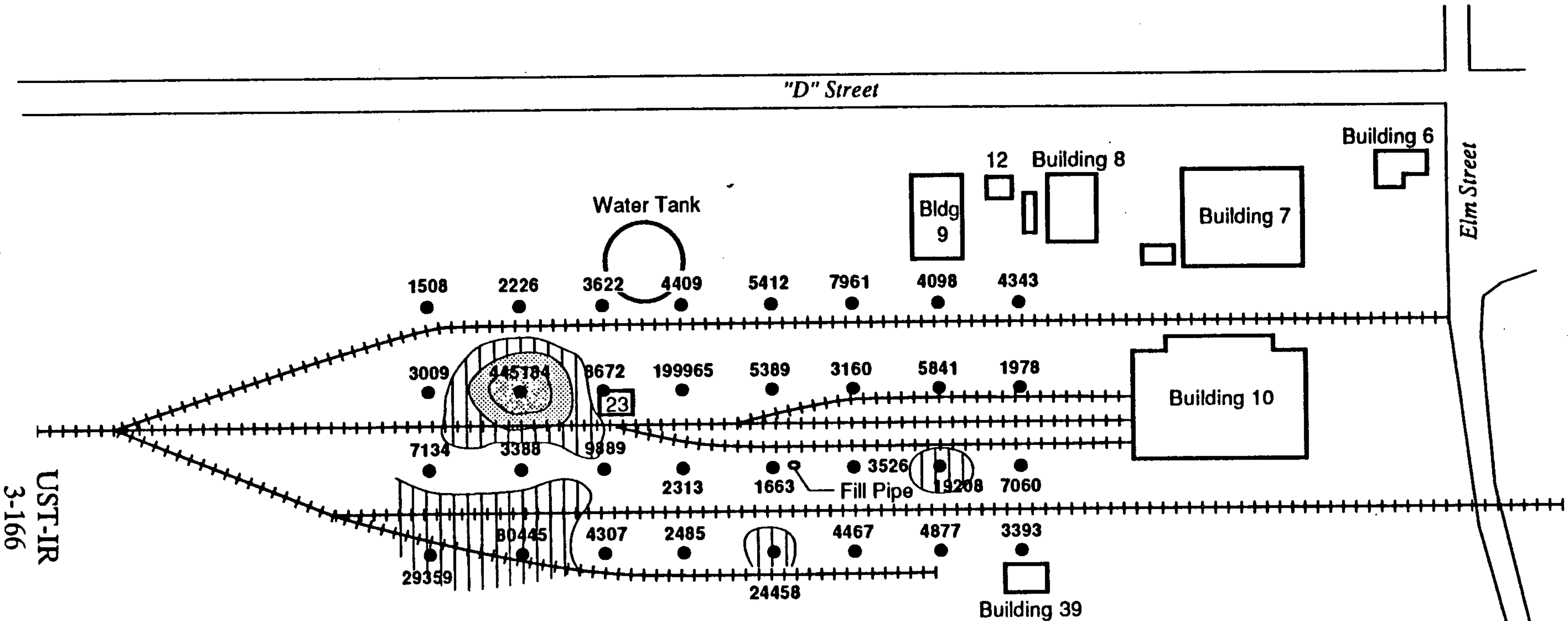
3.53.2 Contamination Assessment

Figures 3-43, 3-44, and 3-45 present the results of the total BTEX, PCE, and TCE components of the passive soil gas survey, respectively. As shown in Figure 3-43, the results indicate moderately elevated ion counts for total BTEX in several areas. Elevated ion counts at six locations ranged from one to two orders of magnitude greater than typical or baseline levels reported for the site. These results suggest possible BTEX contamination in the soil east and west of Building 23 and in the southwestern edge of the survey area near the railroad tracks and north of UST 102. However, active soil gas results for samples collected in the vicinity of this sample at UST 102 do not confirm any detectable levels of BTEX (see Section 3.49).

Soil gas results indicate low-to-high ion counts for PCE at three locations in the survey area (Figure 3-44). Elevated ion counts of six samples in the eastern/northeastern quarter of the site ranged from slightly less than one to nearly three orders of magnitude greater than typical or baseline levels reported for the site. As shown in Figure 3-45, a similar distribution of TCE was identified in this area, which indicates a potential contaminant source distinct from operations at the fuel transfer station. The source of this potential contamination is likely the result of operations at Building 10, the locomotive house and associated railyard.

The remaining soil gas results suggest potential but limited PCE and TCE contamination in samples east and west of Building 23 and in samples at the southwestern edge of the survey area near the railroad tracks and north of UST 102. The one sample east of the building and both samples in the southwestern edge of the survey area also contained elevated levels of total BTEX.

As indicated in Table 3-4, only two TCL VOAs--ethylbenzene and xylene--were detected at very low concentrations (0.005 and 0.033 $\mu g/g$, respectively) in one soil sample from boring S74-1 (see Figure 3-42). Low levels of one VOA TIC were



LEGEND

32 ● Petrex Sample Location and Measured BTEX Value

23 Building Location and Number

Relative Response Values:

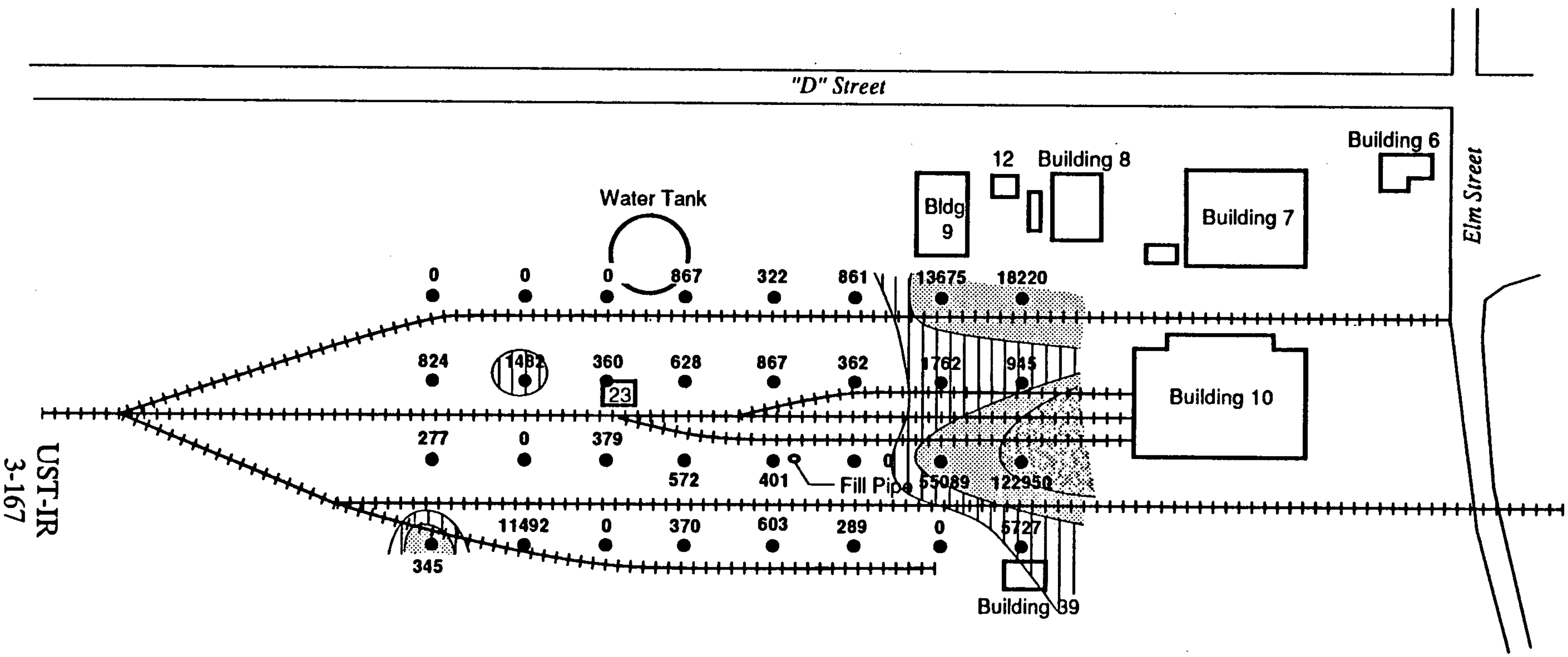
- 400,000 or Greater
- 100,000 – 399,999
- 10,000 – 99,999

N

0 100 Feet

Scale

Figure 3-43
SITE 74
OIL/FUEL TRANSFER STATION
RESULTS OF SOIL GAS SURVEY
TOTAL BTEX



LEGEND

32 ● Petrex Sample Location and Measured Tetrachloroethene Value

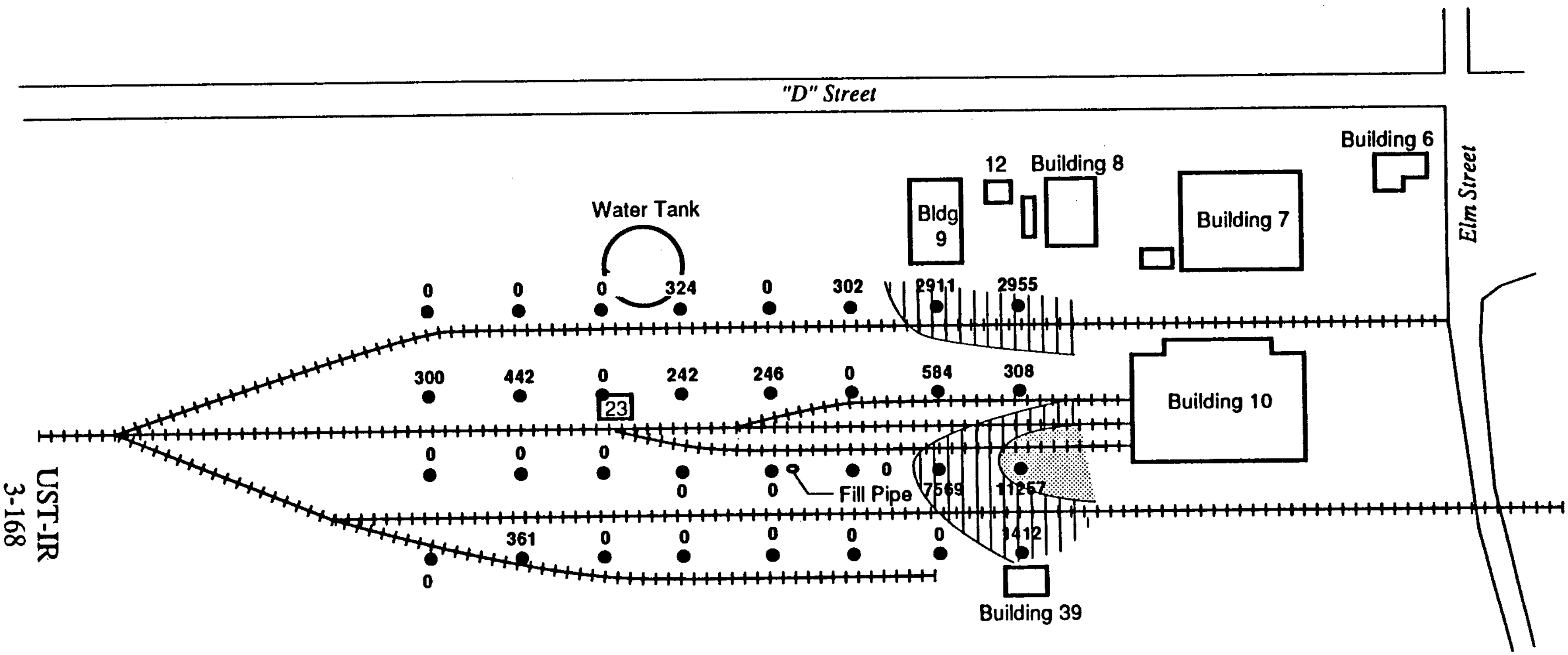
23 Building Location and Number

Relative Response Values:

- 100,000 or Greater
- 10,000 – 99,999
- 900 – 9,999

Figure 3-44
SITE 74
OIL/FUEL TRANSFER STATION
RESULTS OF SOIL GAS SURVEY
TETRACHLOROETHENE

DAMES & MOORE



LEGEND

32 ● Petrex Sample Location and Measured Trichloroethene Value

23 Building Location and Number

Relative Response Values:

- 10,000 or Greater
- 1,000 – 9,999

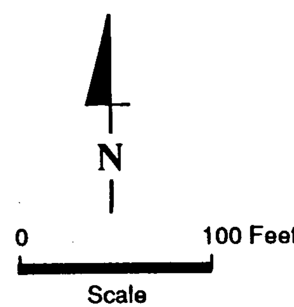


Figure 3-45
SITE 74
OIL/FUEL TRANSFER STATION
RESULTS OF SOIL GAS SURVEY
TRICHLOROETHENE

detected in each of six samples. No TCL BNAs were detected in any samples. Very low levels of between one and four BNA TICs were detected in four soil samples, and from one to 10 unknown BNA TICs were detected in three samples. TPHCs were detected in three samples. The surface sample and the sample collected from a depth of 10 feet in boring S74-2 exhibited TPHC concentrations of 199 μg/g and 56.6 μg/g, respectively. Samples collected at depths of 2.5, 5, and 7.5 feet contained no detectable levels of TPHCs. The highest concentration of TPHCs--1,540 μg/g--was detected at the surface in boring S74-3. However, no TPHCs were detected at any of the subsurface depths. These results indicate that TPHC contamination may be the result of surface spills rather than a leaking tank. A PID reading of 3.4 ppm was detected at 10 feet in boring S74-2.

3.53.3 Conclusions and Recommendations

Results of the passive soil gas survey conducted at Site 74 suggest three areas with potentially significant volatiles soil contamination. Two locations had elevated levels of total BTEX, PCE, and TCE ion counts and are considered potential areas of contamination. These areas were east and west of Building 23, where several spills were reported to have occurred, and in the southwestern edge of the survey area near the railroad tracks and north of UST 102. A third area of potential contamination is located in the eastern quarter of the survey area along several rail lines and near Building 10, the locomotive repair facility. The passive soil gas survey results, though providing only relative volatiles concentrations in the soil, indicate areas that require further investigation to confirm the presence of any significant soil contamination.

No TCL BNAs were detected in soil samples, and only two TCL VOCs were detected in one soil sample at very low concentrations. TPHCs were detected in three soil samples at concentrations ranging from low to high, when compared to the commonly used cleanup level of 100 μg/g. However, the contamination appears to be due to surface spills rather than a leaking tank.

Based on results of the soil gas survey and soil sampling, it is recommended that contaminated soil in the east and west ends of Site 74 be remediated.

4.0 SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

The investigation of USTs at UMDA included sampling and chemical analysis of the unknown contents of five tanks, tank leak testing of 30 active tanks, geophysical surveys at 14 potential UST sites, soil gas surveys at 17 potential UST and fuel oil spill sites, and soil sampling and analysis. Based on these results, Table 4-1 summarizes the conclusions and recommendations for the UST investigation.

As shown in Table 4-1, 30 USTs were leak tested to evaluate their potential for leakage to the surrounding soil. Of the tanks tested, 21 met State tightness criteria and require no immediate action (USTs 1, 3, 4, 6, 8, 9, 10, 13, 14, 15, 16, 19, 24, 26, 27, 28, 29, 30, 31, 32, and 33). However, because U.S. Army regulations require all USTs to be treated as regulated tanks, UMDA may consider annual leak testing to evaluate the integrity of the tanks and to identify potentially leaky tanks.

Two of the 30 active tanks tested (USTs 2 and 12) failed the leak tests and were subsequently scheduled for removal under State of Oregon regulations. No further sampling was conducted at these two tanks. Seven of the USTs (USTs 17, 18, 20, 21, 22, 23, and 25) had inconclusive results, and one tank (UST 11) could not be leak tested during the UST investigation. To evaluate potential leakage from these seven tanks, a total of 23 soil samples from 23 borings were collected adjacent to the tanks and fuel supply lines. (Soil samples could not be collected at UST 17 due to lack of access.) The samples were analyzed for TCL VOAs, TCL BNAs, and TPHCs. At one multiple tank location (USTs 21 to 23), five soil samples were collected from borings installed near the tanks, and two samples were collected near the supply pipeline.

The results of the geophysical surveys indicate unlikely geophysical targets at 10 potential UST sites (USTs 64, 65, 76 and 77, 82, 84, 86, 88 to 90, 91, 99, and Site 43), possible geophysical targets at three potential UST sites (USTs 79, 80, and 81), and a probable geophysical target at one potential UST site (UST 102). No further action is recommended for the 10 sites where USTs are not likely present. However,

TABLE 4-1

Summary of Conclusions and Recommendations

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
1	Passed	--	--	--	--	--	--	No immediate action
2	Failed (subsequently scheduled for removal under State of Oregon regulations)	--	--	--	--	--	--	Soil sampling
3	Passed	--	--	--	--	--	--	No immediate action
4	Passed	--	--	--	--	--	--	No immediate action
6	Passed	--	--	--	--	--	--	No immediate action
8	Passed	--	--	--	--	--	--	No immediate action
9	Passed	--	--	--	--	--	--	No immediate action
10	Passed	--	--	--	--	--	--	No immediate action
11	Not tested	--	--	STA-1 to STA-4	3 @ 10 ft 1 @ 8 ft	4	TCL VOAs, TCL BNAs, TPHCs	No immediate action

TABLE 4-1 (cont'd)]

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
12	Failed (subsequently scheduled for removal under State of Oregon regulations)	--	--	--	--	--	--	Soil sampling
13	Passed	--	--	--	--	--	--	No immediate action
14	Passed	--	--	--	--	--	--	No immediate action
15	Passed	--	--	--	--	--	--	No immediate action
16	Passed	--	--	--	--	--	--	No immediate action
17	Inconclusive	--	--	--	--	--	--	Soil sampling
18	Inconclusive	--	--	STA-9 to STA-12	3 @ 10 ft 1 @ 6.5 ft	4	TCL VOAs, TCL BNAs, TPHCs	No immediate action
19	Passed	--	--	--		--	--	No immediate action
20	Inconclusive	--	--	STA-13 to STA-16	1 @ 10 ft 1 @ 6.5 ft 2 @ 5 ft	4	TCL VOAs, TCL BNAs, TPHCs	Excavation, removal

TABLE 4-1 (cont'd)]

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
21-23	Inconclusive	--	--	STA-17 to STA-23	6 @ 10 ft 1 @ 6.5 ft	7	TCL VOAs, TCL BNAs, TPHCs	No immediate action
24	Passed	--	--	--	--	--	--	No immediate action
25	Inconclusive	--	--	STA-24 to STA-27	3 @ 10 ft 1 @ 6.5 ft	4	TCL VOAs, TCL BNAs, TPHCs	No immediate action
26	Passed	--	--	--	--	--	--	No immediate action
27	Passed	--	--	--	--	--	--	No immediate action
28	Passed	--	--	--	--	--	--	No immediate action
29	Passed	--	--	--	--	--	--	No immediate action
30	Passed	--	--	--	--	--	--	No immediate action
31	Passed	--	--	--	--	--	--	No immediate action
32	Passed	--	--	--	--	--	--	No immediate action
33	Passed	--	--	--	--	--	--	No immediate action

TABLE 4-1 (cont'd)]

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
64	--	Unlikely	Trace (a)	--	--	--	--	No further action
65	--	Unlikely	See Site 73	--	See Site 73	See Site 73	See Site 73	See Site 73
76 and 77	--	Unlikely (small anomaly likely resulted from water line/vault)	Trace (a)	--	--	--	--	No further action
79	--	Possible	Trace (a)	--	--	--	--	Excavation of potential target and closure by UMDA
80	--	Possible	Trace (a)	--	--	--	--	Excavation of potential target and closure by UMDA
81	--	Possible	Trace (a)	--	--	--	--	Excavation of potential target and closure by UMDA
82	--	Unlikely in northern area; unknown in southern area	Trace (a)	--	--	--	--	No further action
84	--	Unlikely	Trace (a)	--	--	--	--	No further action

TABLE 4-1 (cont'd)]

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
86	--	Unlikely (small anomaly was determined to be a steel vault cover)	Trace (a)	--	--	--	--	No further action
88 to 90	--	Unlikely	Trace (a)	--	--	--	--	No further action
91	--	Unlikely	Trace (a)	--	--	--	--	No further action
92	--	--	--	--	--	--	--	Cleaning, decontamination
93	--	--	--	--	--	--	--	Cleaning, decontamination
96	--	--	--	--	--	--	--	Cleaning, decontamination
97	--	--	--	--	--	--	--	Cleaning, decontamination
98	--	--	--	--	--	--	--	Cleaning, decontamination
99	--	Unlikely	Trace (a)	--	--	--	--	No further action
100	--	--	Trace-to-moderate (a)	STA-28 to STA-31	2 @ 10 ft 2 @ 1.5 ft	14	TCL VOAs, TCL BNAs, TPHCs	No immediate action for UST; nearby soil excavation and disposal

TABLE 4-1 (cont'd)]

UST/ Site No.	Results of Tank Leak Testing	Results of Geophysical Survey (Target Status)	Results of Soil Gas Survey	Sample IDs	No. of Borings	Total No. of Samples	Chemical Analyses	Recommended Action
101	--	--	--	STA-32 to STA-35	3 @ 8 ft 1 @ 6.8 ft	4	TCL VOAs, TCL BNAs, TPHCs	No further action
102	--	Probable (two targets side-by-side)	Trace near potential USTs; low-to-moderate at other locations (a) (see Site 74)	STA-36 to STA-38	3 @ 10 ft	13	TCL VOAs, TCL BNAs, TPHCs	No immediate action for UST; excavation of probable target and closure by UMDA; soil sampling
Site 42	--	--	Trace (a)	--	--	--	--	No further action
Site 43	--	Unlikely	Trace(a)	--	--	--	--	No further action
Site 73	--	--	Low-to-moderate (a)	S73-1 to S73-3	3 @ 10 ft	13	TCL VOAs, TCL BNAs, TPHCs	No further action for USTs; nearby soil remediation
Site 74	--	--	Moderate (a)	S74-1 to S74-3	3 @ 10 ft	15	TCL VOAs, TCL BNAs, TPHCs	Soil remediation
				TOTAL	40	82		

(a) See Table 3-3 for summary of active soil gas results.

it is recommended that UMDA excavate the area of the geophysical targets for the three possible and one probable UST sites. If abandoned USTs are encountered during the excavations, it is recommended that they be removed and the soil tested and remediated, if necessary, according to State tank closure procedures.

The results of the soil gas surveys at 17 sites indicate potentially significant soil contamination at four sites--USTs 100 and 102, and Sites 73 and 74 (see Table 3-3 for a summary of active soil gas results). At UST 100, two 10-foot borings and two 1.5-foot borings were completed. At UST 102 and Sites 73 and 74, soil samples were collected from three 10-foot borings at each location to confirm potential soil contamination in areas indicated to have elevated soil gas results. Samples from all borings were analyzed for TCL VOAs, TCL BNAs, and TPHCs. The remaining 13 sites contained insignificant trace or low concentrations of VOAs and are not considered to be a concern. Therefore, no further action is recommended at these sites (other than excavation of areas of possible or probable geophysical targets at several sites, as previously discussed).

5.0 REFERENCES

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APPENDIX A

Underground Storage Tank Information

Revised

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TABLE A-1
UST INFORMATION AND INVESTIGATION SUMMARY

UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or INActive)	Surface Features (d)	Planned Leak Tested	Date of Leak Test	Leak Test Results gal/hr	Tank Contents Sampling	Tank Sample Date	Date of Geophysical Survey	Geophysical Survey Results	Date of Soil Gas Survey
UST 1	ORUM 1	1/Adm.	1	DF2	1,000	A	P	Y (e)	09/22/1992	−0.0089					
UST 2	ORUM 2	1/Adm.	2	DF 2	1,000	A	P	Y	09/22/1992	−36.0 (f)					
UST 3	ORUM 3	1/Adm.	7	DF 2	1,000	A	P	Y	09/22/1992	−0.0088					
UST 4	ORUM 4	1/Adm.	10	DF 2	1,000	A	P	Y	09/22/1992	−0.0021					
UST 5	ORUM 5	1/Adm.	18	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 6	ORUM 6	1/Adm.	30	DF 2	1,000	A	P	Y	09/21/1992	−0.0055					
UST 7	ORUM 7	1/Adm.	32	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 8	ORUM 8	1/Adm.	33	DF 2	1,000	A	P	Y	09/21/1992	−0.0149					
UST 9	ORUM 9	2/VI	416	DF 2	3,000	A	P	Y	09/25/1992	−0.0058					
UST 10	ORUM 10	2/V	419	DF 2	1,002	A	P	Y	09/25/1992	−0.0021					
UST 11	ORUM 11	2/III	612	HT 5	15,194	A	P	Y	N/T*	N/A					
UST 12	ORUM 12	2/III	617	DF 2	2,500	A	P	Y	09/24/1992	−0.1670					
UST 13	ORUM 13	2/II	208	DF 2	1,001	A	P	Y	09/24/1992	−0.0048					
UST 14	ORUM 14	2/II	622	DF 2	1,000	A	P	Y	09/24/1992	−0.0108					
UST 15	ORUM 15	2/IV	654	DF 2	4,006	A	P	Y	10/14/1992	−0.0132					
UST 16	ORUM 16	2/IV	655	DF 2	6,008	A	P	Y	11/16/1992	−0.0204					
UST 17	ORUM 17	2/IV	660	DF 2	10,310	A	P	Y	10/14/1992	Inconclusive					
UST 18	ORUM 18	1/Adm.	28	HT 5	15,194	A	P	Y	10/13/1992	Inconclusive					
UST 19	ORUM 19	1/Adm.	28	HT 5	8,000	A	P	Y	10/12/1992	−0.0326					
UST 20	ORUM 20	1/Adm.	37	HT 5	10,529	A	P	Y	10/13/1992	Inconclusive					
UST 21	ORUM 21	1/Adm.	31	HT 5	15,194	A	P	Y	10/12/1992	Inconclusive					
UST 22	ORUM 22	1/Adm.	31	HT 5	12,088	A	P	Y	10/13/1992	Inconclusive					
UST 23	ORUM 23	1/Adm.	31	HT 5	12,088	A	P	Y	10/13/1992	Inconclusive					
UST 24	ORUM 24	2/II	131	HT 5	15,194	A	P	Y	11/16/1992	−0.0124	Tank only; not pipelines				
UST 25	ORUM 25	2/VI	433	HT 5	15,194	A	P	Y	10/14/1992	Inconclusive					
UST 26	ORUM 26	1/Adm.	15A	DF 2	675	A	P	Y	09/23/1992	−0.0057					
UST 27	ORUM 27	1/Adm.	15B	DF 2	675	A	P	Y	09/23/1992	−0.0072					
UST 28	ORUM 28	1/Adm.	16A	DF 2	675	A	P	Y	09/23/1992	−0.0066					
UST 29	ORUM 29	1/Adm.	16B	DF 2	675	A	P	Y	09/23/1992	−0.0042					
UST 30	ORUM 30	1/Adm.	35	DF 2	375	A	P	Y	09/22/1992	−0.0019					
UST 31	ORUM 31	1/Adm.	55	DF 2	1,000	A	P	Y	09/22/1992	−0.0169					
UST 32	ORUM 32	2/II	116	DF 2	1,000	A	P	Y	09/23/1992	−0.0032					
UST 33	ORUM 33	2/II	129	DF 2	1,000	A	P	Y	09/23/1992	0.0026					
UST 34	ORUM 34	1/Adm.	34	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 35	ORUM 35	2/II	105	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 36	ORUM 36	2/II	106	DF 2	10,310	INA	P	Y	N/T*	N/A					
UST 37	ORUM 37	2/II	115	HT 5	10,310	INA	P	Y	N/T*	N/A					
UST 38	ORUM 38	2/II	117	HT 5	10,310	INA	P	Y	N/T*	N/A					
UST 39	ORUM 39	2/V	486	HT 5	25,049	INA	P	Y	N/T*	N/A					
UST 40	ORUM 40	2/II	130	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 41	ORUM 41	2/VII	Airport	Gasoline	10,310	INA	RMD	NO	N/A	N/A					
UST 42	ORUM 42	1/Adm.	Fuel Yd.	Gasoline	50,750	A	P	Y	N/T*	N/A					
UST 43	ORUM 43	1/Adm.	Fuel Yd.	DF 2	50,750	A	P	Y	N/T*	N/A					

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TABLE A-1
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UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or INActive)	Surface Features (d)	Planned Leak Tested	Date of Leak Test	Leak Test Results gal/hr	Tank Contents Sampling	Tank Sample Date	Date of Geophysical Survey	Geophysical Survey Results	Date of Soil Gas Survey
UST 44	ORUM 44	1 / Adm.	5	Waste oil	500	INA	RMD	NO	N/A	N/A					
UST 45	ORUM 45	1 / Adm.	9/10	Waste oil	500	INA	RMD	NO	N/A	N/A					
UST 46	ORUM 46	1 / Adm.	24	Gasoline	140	INA	RMD	NO	N/A	N/A					
UST 47	ORUM 47	2 / II	9/160	Gasoline	110	INA	P	Y	N/T *	N/A					
UST 48	ORUM 48	2 / II	135	Gasoline	110	INA	P	Y	N/T *	N/A					
UST 49	ORUM 49	2 / II	133	Gasoline	110	INA	P	Y	N/T *	N/A					
UST 50	ORUM 50	2 / II	133	Gasoline	110	INA	P	Y	N/T *	N/A					
UST 51	ORUM 53	1 / Adm.	51	DF 2	1,000	INA	P	Y	N/T *	N/A					
UST 52	ORUM 54	2 / II	104	DF 2	1,000	INA	P	Y	N/T *	N/A					
UST 53	ORUM 55	2 / V	448/Wildlife Station	DF 2	1,000	INA	P	Y	N/T *	N/A					
UST 54	ORUM 56	2 / IV	656	Chemical Decon.	Unknown	A	RPD	NO	N/A	N/A					
UST 55	ORUM 74	2 / III	617	Gasoline or DF2	Unknown	INA	RMD	Y	N/T *	N/A					
UST 56	ORUM 75	2 / III	457	Gasoline or DF2	Unknown	INA	P	Y	N/T *	N/A					
UST 57	ORUM 77	2 / V	419	DF 2	Unknown	INA	P	Y	N/T *	N/A					
UST 58	ORUM 78	2 / IV	654	Chemical Decon.	Unknown	A	P	Y (g)	NT (g)	N/A	NO (g)				
UST 59	ORUM 80	2 / V (d)	Site 43 – Old Fuel Yd.	Gasoline or DF 2	3,000	INA	NP	NO	N/A	N/A			09/18/1992	Unlikely	10/08/1992
UST 60	ORUM 81	2 / V (d)	Site 43 – Old Fuel Yd.	Gasoline or DF 2	3,000	INA	NP	NO	N/A	N/A			09/18/1992	Unlikely	10/08/1992
UST 61	ORUM 82	2 / V (d)	Site 43 – Old Fuel Yd.	Gasoline or DF 2	3,000	INA	NP	NO	N/A	N/A			09/18/1992	Unlikely	10/08/1992
UST 62	ORUM 83	2 / V (d)	Site 43 – Old Fuel Yd.	Gasoline or DF 2	3,000	INA	NP	NO	N/A	N/A			09/18/1992	Unlikely	10/08/1992
UST 63	ORUM n/a	1 / Adm.	27	Battery Acid	500	A	P	NO	N/A	N/A					
UST 64	ORUM n/a	1 / Adm.	84	Diesel	900	INA	NP	NO	N/A	N/A			09/16/1992	Unlikely	10/29/1992
UST 65	ORUM n/a	1 / Adm.	Site 42 E – Bldg. 6	Diesel	800	INA	NP	NO	N/A	N/A			09/29/1992	Unlikely	09/24/1992
UST 66	ORUM n/a	1 / Adm.	Site 42 E – Bldg. 6	Gasoline	550	INA	NP	NO	N/A	N/A					10/05/1992
UST 67	ORUM n/a	1 / Adm.	Site 42 E – Bldg. 6	Gasoline	10,000	INA	NP	NO	N/A	N/A					10/05/1992
UST 68	ORUM n/a	1 / Adm.	Site 42 E – Bldg. 6	Gasoline	8,000	INA	NP	NO	N/A	N/A					10/05/1992
UST 69	ORUM n/a	1 / Adm.	Site 42 E – Bldg. 6	Gasoline	25,000	INA	NP	NO	N/A	N/A					10/05/1992
UST 70	ORUM n/a	1 / Adm.	Site 42 W;N of 23	DF2	26,200	INA	NP	NO	N/A	N/A					10/08/1992
UST 71	ORUM n/a	1 / Adm.	Site 42 W;N of 23	DF2	11,150	INA	NP	NO	N/A	N/A					10/08/1992
UST 72	ORUM n/a	1 / Adm.	Site 42 W;N of 23	DF2	11,275	INA	NP	NO	N/A	N/A					10/08/1992
UST 73	ORUM n/a	1 / Adm.	Site 42 W;N of 23	DF2	24,950	INA	NP	NO	N/A	N/A					10/08/1992
UST 74	ORUM n/a	1 / Adm.	Site 42 W;N of 23	Stove Oil	5,104	INA	NP	NO	N/A	N/A					10/08/1992
UST 75	ORUM n/a	1 / Adm.	Site 42 W;N of 23	Stove Oil	4,011	INA	NP	NO	N/A	N/A					10/08/1992
UST 76	ORUM n/a	1 / Adm.	SE of 77	Diesel	600	INA	NP	NO	N/A	N/A			09/14/1992	Possible	10/11/1992
UST 77	ORUM n/a	1 / Adm.	SE of 77	Light oil	800	INA	NP	NO	N/A	N/A			09/14/1992	Possible	10/11/1992
UST 78	ORUM n/a	1 / Adm.	28	Boiler blowdown	500	INA	NP	NO	N/A	N/A					
UST 79	ORUM n/a	1 / Adm.	54	HT 5	1,000	INA	NP	NO	N/A	N/A			09/19/1992	Possible	11/09/1992
UST 80	ORUM n/a	1 / Adm.	53	HT 5	1,000	INA	NP	NO	N/A	N/A			09/23/192	Possible	11/04/1992
UST 81	ORUM n/a	1 / Adm.	52	HT 5	1,000	INA	NP	NO	N/A	N/A			09/16/1992	Possible	10/30/1992
UST 82	ORUM n/a	1 / Adm.	36	HT 5	800	INA	NP	NO	N/A	N/A			09/16/1992	Unknown	11/02/1992
UST 83	ORUM 5	1 / Adm.	18	DF 2	1,000	INA	P	NO	N/A	N/A					
UST 84	ORUM n/a	1 / Adm.	5	DF 2	3,000	INA	NP	NO	N/A	N/A			09/24/1992	Unlikely	11/06/1992
UST 85	ORUM n/a	1 / Adm.	31	Condensation Tank	Unknown	INA	NP	NO	N/A	N/A					
UST 86	ORUM n/a	1 / Adm.	F24	HT 5	3,000	INA	NP	NO	N/A	N/A			09/12/1992	Unlikely	10/11/1992

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TABLE A-1
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UST No. (D&M)	ORUM No. (USACE) (a)	Plate No./ Area (b)	Building / Location	Material Stored in Tank (c)	Tank Volume (Estimated in Gallons)	Status (Active or INActive)	Surface Features (d)	Planned Leak Tested	Date of Leak Test	Leak Test Results gal/hr	Tank Contents Sampling	Tank Sample Date	Date of Geophysical Survey	Geophysical Survey Results	Date of Soil Gas Survey
UST 87	ORUM n/a	2 / II	52/206	DF 2	1,000	INA	P	Y	N/T*	N/A					
UST 88	ORUM n/a	2 / V	Supply House 3	DF 2	500	INA	NP	NO	N/A	N/A			09/1992	Unlikely	10/21/1992
UST 89	ORUM n/a	2 / V	Supply House 3	DF 2	500	INA	NP	NO	N/A	N/A			09/1992	Unlikely	10/21/1992
UST 90	ORUM n/a	2 / V	Supply House 3	DF 2	500	INA	NP	NO	N/A	N/A			09/1992	Unlikely	10/21/1992
UST 91	ORUM n/a	2 / V	--	DF 2	250	INA	NP	NO	N/A	N/A			09/26/1992	Unlikely	10/10/1992
UST 92	ORUM n/a	2 / V	486	Likely DF2	Unknown	INA	P	Y	N/T*	N/A	Y	09/23/1992			
UST 93	ORUM n/a	2 / V	E of 486	Water	600	INA	P	NO	N/A	N/A	Y	09/23/1992			
UST 94	ORUM n/a	2 / VII	433	Boiler blowdown	500	INA	P	NO	N/A	N/A					
UST 95	ORUM 78	2 / IV	654	Chemical Decon.	Unknown	A	P	Y (g)	N/T (g)	N/A	NO (g)				
UST 96	ORUM n/a	2 / VII	Airport	Water	Unknown	INA	P	Y	N/T*	N/A	Y	09/16/1992			
UST 97	ORUM n/a	2 / VII	433	Unknown–Empty	30–50	INA	P	NO	N/A	N/A	NO	Empty			
UST 98	ORUM n/a	2 / V	486	Unknown – dry	Unknown	INA	P	NO	N/A	N/A	Y	09/15/1992			
UST 99	ORUM n/a	2 / II	113	Unknown	Unknown	INA	NP	NO	N/A	N/A			09/26/1992	Unlikely	10/20/1992
UST 100	ORUM n/a	1 / Adm.	29	DF 2	Unknown	INA	NP	NO	N/A	N/A					11/10/1992
UST 101	ORUM n/a	2 / V	419	Oil	Unknown	INA	NP	NO	N/A	N/A	Y	09/23/1992			
UST 102	ORUM n/a	1 / Adm.	Unknown	DF 2	12,000	INA	NP	NO	N/A	N/A			09/13/1992	Probable	10/24/1992
Site 74 – Oil/Fuel Transfer Sta		1 / Adm.	23	Gasoline or DF 2	N/A	INA	N/A	N/A	N/A	N/A					09/15/1992

a Tank designation from U.S. Army Corps of Engineers 1989, UMDA underground storage tank investigation
b See enclosed Plates 1 and 2.
c DF2 = diesel fuel No. 2; HT5 = Heating oil No. 5.
d P = present; NP = not present; RMD = recently removed; RPL = recently replaced
e Y = Yes.
f A shaded value indicates an exceedance of the State standard of 0.05 gal/hr.
g This tank is the same as UST 58 (ORUM 78) and was to be sampled and leak tested. This tank was removed from the investigation due to difficulties with access and sampling schedule. Presently, access to K–Block is restricted to DOD personnel only.

N/A = Not Applicable

* NT = Not Tested. During the UST field investigation, these tanks were scheduled by UMDA for future closure and removal under a separate contract. UST 11 was not leak tested due to tank availability. USTs 42 and 43 have a leak detection system and were not leak tested.

TABLE A-2
Underground Storage Tank Information (a)

INSTALLATION: UMATILLA ARMY DEPOT, UMATILLA, OREGON
PROJECT: INVENTORY OF UNDERGROUND STORAGE TANKS (UST'S)
DATE : AUG/SEPT 1989

SEQ NO.	TANK I.D.	INSTALL TANK NO./ BLDG NO	CURRENT TANK STATUS	LOCALE ON INSTL	YEAR INST (19)	ESTIM/ VOLUM SIZE (GAL)	PRODCT LAST STORED	TANK MAT'L	INTER PROT	EXTER PROT	TANK PIPING	ESTIMAT DEPTH OF TANK	LAST TANK TGHT TEST	EXST SPIL CON-TROL	OVR-FLW CON-TROL	EVI-DNCE OF SPLS	EVI-DNCE OF LKS	GRND WATER CON-TAMIN	DEPTH OF GRND H2O (FT)	SOIL TYPE	PRIMARY REGULATOR	REGUL TANK	NEEDS TANK TIGHTNS TESTNG	DERA ELI-GIBLE	REMARKS
1	ORUM 001	BLD 1	ACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
2	ORUM 002	BLD 2	ACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		NO PIPE GUARDS/PARKING AREA
3	ORUM 003	BLD 7	ACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		NO PIPE GUARDS/DRIVE
4	ORUM 004	BLD 10	ACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		NO PIPE GUARDS/DRIVE
5	ORUM 005	BLD 18	INACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	YES	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	SUSPECTED LEAKAGE
6	ORUM 006	BLD 30	ACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		NO PIPE GUARDS/DRIVE
7	ORUM 007	BLD 32	INACTIVE	ADMIN	45	1002	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	YES	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	SUSPECTED LEAKAGE
8	ORUM 008	BLD 33	ACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
9	ORUM 009	BLD 416	ACTIVE	MAINT	45	3004	DF 2	STEEL	NONE	NONE	BSTL/COP	3.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
10	ORUM 010	BLD 419	ACTIVE	MAINT	45	1002	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		RECENT EXCAVATION AT TANK
11	ORUM 011	BLD 612	ACTIVE	MAINT	45	15194	HT 5	STEEL	NONE	NONE	BSTL/COP	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
12	ORUM 012	BLD 617	ACTIVE	AMMO	45	2500	DF 2	STEEL	NONE	NONE	BSTL/COP	7.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
13	ORUM 013	BLD 208	ACTIVE	AMMO	45	1001	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		RECENT EXCAVATION AT TANK
14	ORUM 014	BLD 622	ACTIVE	AMMO	65	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
15	ORUM 015	BLD 656	ACTIVE	CHEM	82	4006	DF 2	STEEL	NONE	NONE	B/STEEL	3.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			NO PIPE GUARDS
16	ORUM 016	BLD 655	ACTIVE	CHEM	82	6008	DF 2	STEEL	NONE	NONE	B/STEEL	3.0 FT.	NONE	YES	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			NO PIPE GUARDS
17	ORUM 017	BLD 660	ACTIVE	CHEM	65	10310	DF 2	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			NO PIPE GUARDS/DRIVE
18	ORUM 018	BLD 28	ACTIVE	ADMIN	45	15194	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
19	ORUM 019	BLD 28	ACTIVE	ADMIN	45	8000	HT 5	STEEL	NONE	NONE	B/STEEL	3.0 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
20	ORUM 020	BLD 37	ACTIVE	MAINT	45	10529	HT 5	STEEL	NONE	NONE	B/STEEL	3.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
21	ORUM 021	BLD 31	ACTIVE	MAINT	45	15194	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			LIMITED NO/.OF PIPE GUARDS
22	ORUM 022	BLD 31	ACTIVE	MAINT	45	12088	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			LIMITED NO/.OF PIPE GUARDS
23	ORUM 023	BLD 31	ACTIVE	MAINT	45	12088	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			LIMITED NO/.OF PIPE GUARDS
24	ORUM 024	BLD 131	ACTIVE	MAINT	45	15194	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
25	ORUM 025	BLD 433	ACTIVE	AMMO	45	15194	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			
26	ORUM 026	BLD 15A	ACTIVE	ADMIN	45	675	DF 2	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
27	ORUM 027	BLD 15B	ACTIVE	ADMIN	45	675	DF 2	STEEL	NONE	NONE	BSTL/COP	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
28	ORUM 028	BLD 16A	ACTIVE	ADMIN	45	675	DF 2	STEEL	NONE	NONE	BSTL/COP	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
29	ORUM 029	BLD 16B	ACTIVE	ADMIN	45	675	DF 2	STEEL	NONE	NONE	BSTL/COP	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
30	ORUM 030	BLD 35	ACTIVE	ADMIN	45	375	DF 2	STEEL	NONE	NONE	BSTL/COP	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
31	ORUM 031	BLD 55	ACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
32	ORUM 032	BLD 116	ACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
33	ORUM 033	BLD 129	ACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		
34	ORUM 034	BLD 34	INACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	NOT USED SINCE JAN 84/REMOVABLE
35	ORUM 035	BLD 105	INACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	NOT USED SINCE JAN 84/REMOVABLE
36	ORUM 036	BLD 106	INACTIVE	MAINT	45	10310	DF 2	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL		X	NOT USED SINCE JAN 84/REMOVABLE
37	ORUM 037	BLD 115	INACTIVE	MAINT	45	10310	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL		X	NOT USED SINCE JAN 84/REMOVABLE
38	ORUM 038	BLD 117	INACTIVE	MAINT	45	10310	HT 5	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL		X	NOT USED SINCE JAN 84/REMOVABLE
39	ORUM 039	BLD 486	INACTIVE	AMMO	45	25049	HT 5	STEEL	NONE	NONE	B/STEEL	4.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL		X	NOT USED SINCE JAN 84/REMOVABLE
40	ORUM 040	BLD 130	INACTIVE	AMMO	45	1000	DF 2	STEEL	NONE	NONE	B/STEEL	2.5 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	NOT USED SINCE JAN 84/REMOVABLE
41	ORUM 041	AIRPORT	INACTIVE	ARPRT	45	10310	GAS	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X	X	NOT USED SINCE JAN 84/REMOVABLE
42	ORUM 042	FUEL YD	ACTIVE	FUEL YD	84	50750	GAS	STEEL	CATH	ASPHLT	FBRGLSS	4.0 FT.	5/88	NO	NO	NO	YES	UNKWN	180-270	CLAY/SLTS	STATE	X	X		PIPING W/PRESSURE MONITORS
43	ORUM 043	FUEL YD	ACTIVE	FUEL YD	84	50750	DF 2	STEEL	CATH	ASPHLT	FBRGLSS	4.0 FT.	5/88	NO	NO	NO	YES	UNKWN	180-270	CLAY/SLTS	STATE	X	X		PIPING W/PRESSURE MONITORS
44	ORUM 044	BLD 5	ACTIVE	MAINT	48	500	USD OIL	STEEL	NONE	NONE	B/STEEL	0.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		MORE THAN 110 GALLONS
45	ORUM 045	BLD 9-10	ACTIVE	MAINT	42	500	USD OIL	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		MORE THAN 110 GALLONS

LEGEND	
-1100gal	- Less than 1100 DeMinimus Exlusion (EPA)
ACTIVE	- Active tank, in use
ACTIVE?	Listed: Active (if inactive...remove?)
AN	- Acid Neutralization
ASB/CMNT	- Asbestos Cement Pipe
ASPHLT	- Asphalt Coating
ASPHLT	- Asphaltic Coating
B/STEEL	- Bare Steel
BLD	- Building (w/number or other description)
BSTL/COP	- Bare Steel and/or Copper Pipe
BSTL/VCP	- Bare Steel and/or Vitrified Clay Pipe
CATH	- Cathodic Protection
CONFL	- Contaminated Fuel
CLAY/SLTS	- Clayey Silts (worst soil type on Base)
CONC	- Concrete
DF ( )	- Diesel Fuel (plus weight)
EXCLUS	- Exclusion (as a regulated tank)
FBRGLSS	- Fiberglass/plastic (either pipe or tank)
GAL STL	- Galvanized Steel Pipe
GAS	- Gasoline (unleaded)
HT ( )	- Heating Oil (plus oil wieght)
HT OIL	- Heating Oil (Diesel or other)
INACTIVE	- UST not in active use: Removal?
KEROS	- Kerosene
NOT REG	- Not a Regulated Tank (State or EPA)
ORUM	- ORegon, UMatilla AD (classification code
PAINT	- Painted (ie: Asphaltic, primer, etc.)
PROT	- Protection
SOLVNT	- Solvent
UNKWN	- Unknown
USD OIL	- Used Oil
UST	- Underground Storage Tank

TABLE A-2
Underground Storage Tank Information (a)

INSTALLATION: UMATILLA ARMY DEPOT, UMATILLA, OREGON
PROJECT: INVENTORY OF UNDERGROUND STORAGE TANKS (UST'S)
DATE : AUG/SEPT 1989

SEQ NO.	TANK I.D.	INSTALL TANK NO./ BLDG NO	CURRENT TANK STATUS	LOCALE ON INSTL	YEAR INST (19)	ESTIM/ VOLUM SIZE (GAL)	PRODCT LAST STORED	TANK MAT'L	INTER PROT	EXTER PROT	TANK PIPING	ESTIMAT DEPTH OF TANK	LAST TANK TGHT TEST	EYST SPIL CON-TROL	OVR-FLW CON-TROL	EVI-DNCE OF SPLS	EVI-DNCE OF LKS	GRND WATER CON-TAMIN	DEPTH OF GRND H2O (FT)	SOIL TYPE	PRIMARY REGULATOR	REGUL TANK	NEEDS TANK TIGHTNS TESTNG	DERA ELI-GIBLE	REMARKS
46	ORUM 046	BLD 26	INACTIVE	MAINT	41	140	GAS	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X	X	NOT USED SINCE JAN 84/REMOVABLE
47	ORUM 047	BLD 9-160	ACTIVE	AMMO	50	110	GAS	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		110 GALLON TANK
48	ORUM 048	BLD 135	ACTIVE	AMMO	48	110	GAS	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		110 GALLON TANK
49	ORUM 049	BLD 133	ACTIVE	AMMO	46	110	GAS	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		110 GALLON TANK
50	ORUM 050	BLD 133	ACTIVE	AMMO	43	110	GAS	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		110 GALLON TANK
51	ORUM 051	BLD 655	ACTIVE	CHEM	83	2500	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	YES	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	UPGRADING OVERFLOW PROTECTION
52	ORUM 052	BLD 655	ACTIVE	CHEM	83	1000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	YES	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	UPGRADING OVERFLOW PROTECTION
53	ORUM 053	BLD 51	ACTIVE	ADMIN	45	1000	DF 2	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	YES	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal		TANK LISTING/NEED REPLACEMENT
54	ORUM 054	BLD 104	INACTIVE	MAINT	45	1000	DF 2	STEEL	NONE	NONE	BSTL/COP	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	NOT USED SINCE JAN 84/REMOVABLE
55	ORUM 055	?	INACTIVE	AMMO	45	1000	DF 2	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL	-1100gal	X	NOT USED SINCE JAN 84/REMOVABLE
56	ORUM 056	BLD 656	ACTIVE	CHEM	84	?	CHEM	CONC	NONE	NONE	GAL/STL	3.0 FT.	NONE	NO	YES	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X	X		NERVE AGNT: OR6213820917
57	ORUM 057	BLD 622	ACTIVE	CHEM	45	1250	SEWAGE	CONC	NONE	NONE	ASB/CMNT	2.5 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
58	ORUM 058	BLD 614	TEMP	AMMO	45	1250	SEWAGE	STEEL	NONE	PAINT	GAL STL	0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	TEMPORARILY OUT OF USE
59	ORUM 059	BLD 608	ACTIVE	AMMO	45	4000	SEWAGE	CONC	NONE	NONE	GAL STL	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
60	ORUM 060	BLD 208	ACTIVE	AMMO	45	5000	SEWAGE	CONC	NONE	NONE	GAL STL	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
61	ORUM 061	BLD 131	ACTIVE	AMMO	45	6000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
62	ORUM 062	?	ACTIVE	AMMO	45	5000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
63	ORUM 063	BLD 457	?	AMMO	45	1000	SEWAGE	STEEL	NONE	NONE	B/STEEL	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	INFO ON TANK NOT COMPLETE
64	ORUM 064	BLD 660	ACTIVE	CHEM	79	1000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
65	ORUM 065	SEW LAGN	INACTIVE	AMMO	45	5E+05	SEWAGE	CONC	NONE	NONE	BSTL/VCP	0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
66	ORUM 066	BLD 44	ACTIVE	AMMO	45	40000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
67	ORUM 067	BLD 417	INACTIVE	AMMO	45	3000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	?PERMANENTLY OUT OF USE?
68	ORUM 068	BLD 415	ACTIVE	AMMO	45	3000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	3.0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
69	ORUM 069	BLD 420	ACTIVE	AMMO	45	3000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	0 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
70	ORUM 070	BLD 486	INACTIVE	AMMO	45	4000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	NOT USED SINCE JAN 84/REMOVABLE
71	ORUM 071	BLD 493	INACTIVE	AMMO	45	4000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	NOT USED SINCE JAN 84/REMOVABLE
72	ORUM 072	BLD 419	ACTIVE	AMMO	45	4000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	
73	ORUM 073	BLD 133/5	INACTIVE	AMMO	45	1 MILL	WATER	CONC	NONE	NONE	BSTL/VCP	0 FT.	NA	NA	NA	NA	NA	NA	180-270	CLAY/SLTS	NA	NA	NA	NA	WATER RESEVIOR
74	ORUM 074	BLD 617	ACTIVE	AMMO	45	?	DF 2	STEEL	NONE	NONE	BSTL/COP	7.0 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			NO INSTALL. INFO FOR TANK
75	ORUM 075	BLD 457	INACTIVE	AMMO	50	?	GAS	STEEL	NONE	NONE	BSTL/COP	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X		X	TANK DISCOVERED W/UST INVENTORY
76	ORUM 076	BLD 448	INACTIVE	AMMO	45	4000	SEWAGE	CONC	NONE	NONE	BSTL/VCP	2.5 FT.	NA	NO	NO	NO	NO	NA	180-270	CLAY/SLTS	NOT REG	NA	NA	NA	TANK DISCOVERED W/UST INVENTORY
77	ORUM 077	BLD 419	?	AMMO	45	?	DF 2	STEEL	NONE	NONE	B/STEEL	2.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			TANK DISCOVERED W/UST INVENTORY
78	ORUM 078	BLD 654	ACTIVE	CHEM	82	?	DF 2	STEEL	NONE	NONE	?	? FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	NOT REG	HT OIL			TANK DISCOVERED W/UST INVENTORY
79	ORUM 079	BLD 654	??? ACTUAL	TANK	???	?	?	?	?	?	?	? FT.	?	?	?	?	?	?	180-270	?	?	?	?	?	PROBABLE MANHOLE FOR H20 LINE
80	ORUM 080	OLD FL YD	INACTIVE	AMMO	45	?	GAS/DF	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X		X	DERA ELIGIBLE: IF IN EXISTENCE
81	ORUM 081	OLD FL YD	INACTIVE	AMMO	45	?	GAS/DF	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X		X	DERA ELIGIBLE: IF IN EXISTENCE
82	ORUM 082	OLD FL YD	INACTIVE	AMMO	45	?	GAS/DF	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X		X	DERA ELIGIBLE: IF IN EXISTENCE
83	ORUM 083	OLD FL YD	INACTIVE	AMMO	45	?	GAS/DF	STEEL	NONE	NONE	B/STEEL	3.5 FT.	NONE	NO	NO	NO	NO	UNKWN	180-270	CLAY/SLTS	STATE	X		X	DERA ELIGIBLE: IF IN EXISTENCE
																			180-270						

LEGEND	
-1100gal	- Less than 1100 DeMinimus Exlusion (EPA)
ACTIVE	- Active tank, in use
ACTIVE?	Listed: Active (if inactive...remove?)
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ASB/CMNT	- Asbestos Cement Pipe
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KEROS	- Kerosene
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ORUM	- ORegon, UMatilla AD (classification code
PAINT	- Painted (ie: Asphaltic, primer, etc.)
PROT	- Protection
SOLVNT	- Solvent
UNKWN	- Unknown
USD OIL	- Used Oil
UST	- Underground Storage Tank

a) U.S. Army Corps of Engineers Investigation and Evaluation of Underground Storage Tanks, UMDA, September, 1989.

APPENDIX B

Tank Leak Testing Certificates and Results

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: OCTOBER 12, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#019	8,000	HT 5	-.0326	
#021	15,000	HT 5	INCONCLUSIVE	

REMARKS: TANK #019 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. TANK #021 WAS TESTED BUT BECAUSE OF ERRATIC TEMPERATURE READINGS, TESTER FELT THE TANK WAS STILL UNSETTLED.

APPROVAL: DRH/SLD SIGNATURE: [signature]

HORNER EZY-CHEK

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 (503) 643-5374

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON FRED KOLBERG

ADDRESS 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE LINTHICUM, MD 21090

TELEPHONE (410) 859-5049

TANK ADDRESS UMDA

CITY, STATE UMATILLA, OR

TEST METHOD HORNER EZY-CHEK

TEST DATE OCTOBER 13, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#018	15,000	HT 5	INCONCLUSIVE	
#020	10,000	HT 5	INCONCLUSIVE	
#022			INCONCLUSIVE	
#023			INCONCLUSIVE	

REMARKS TANK SYSTEMS #018 & #020 SHOWED ERRATIC TEMPERATURE READINGS; TANKS UNSETTLED. #018 WAS HEATED +30° 3 DAYS BEFORE TEST; #020 ALSO SHOWED UNSTABLE TEMP. READINGS--TANK SEVERELY TIPPED. #022 & #023 PART OF 4-TANK MANIFOLD--GATE CHECK VALVES SEEPING, NEED TO REPAIR OR ISOLATE EA. TANK.

APPROVAL DRH SIGNATURE

HORNER EZY-CHEK

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 (503) 643-5374

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON FRED KOLBERG

ADDRESS 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE LINTHICUM, MD 21090

TELEPHONE (410) 859-5049

TANK ADDRESS UMDA

CITY, STATE UMATILLA, OR

TEST METHOD HORNER EZY-CHEK

TEST DATE OCTOBER 14, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#015	4000	DIESEL	-.0132	
#017	10,000	DIESEL	INCONCLUSIVE	
#025	15,000	HT 5	INCONCLUSIVE	

REMARKS TANK #015 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. #017 HAD BOILER TURNED ON DURING TEST--ADDED 35 GAL. MADE SECOND ATTEMPT TO TEST WITH POOR RESULTS. #025 TANK WOULD NOT CALIBRATE PROPERLY--TANK SEVERELY TIPPED.

APPROVAL DRH SIGNATURE Dana R. Hampton

HORNER EZY-CHEK

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER	DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY
CONTACT PERSON	FRED KOLBERG
ADDRESS	849 INTERNATIONAL DRIVE, STE. 320
CITY, STATE	LINTHICUM, MD 21090
TELEPHONE	(410) 859-5049
TANK ADDRESS	UMDA
CITY, STATE	UMATILLA, OR
TEST METHOD	HORNER EZY-CHEK
TEST DATE	SEPTEMBER 21, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#006	1000	DIESEL	-.0055	
#008	1000	DIESEL	-.0149	

REMARKS TANKS AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME.

APPROVAL DRH/MRH SIGNATURE [illegible signature] #12120

HORNER EZY-CHEK

UST-IR
B-5

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374 OR (503) 624-0980

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 22, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#030	375	DIESEL	-.0019	
#002	1000	DIESEL	NOT TIGHT	
#004	1000	DIESEL	-.0021	

REMARKS: TANKS #30 AND #4 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. TANK SYSTEM #2 DOES NOT MEET TEST CRITERIA FOR OVER-FILL TESTING STANDARDS DUE TO THE INABILITY OF THE SYSTEM TO HOLD PRODUCT AT SUFFICIENT HEIGHT FOR TEST.

APPROVAL: DRH/MRH SIGNATURE: David R Hampton #1212C

HORNER EZY-CHEK

UST-IR
B-6

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374 OR (503) 624-0980

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 22, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#001	1000	DIESEL	-.0089	
#031	1000	DIESEL	-.0169	
#003	1000	DIESEL	-.0088	
#026	675	DIESEL	INCONCLUSIVE	

REMARKS: TANKS #1, #31 & #3 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. TANK SYSTEM #26 WILL BE RETESTED BECAUSE EQUIPMENT WAS TURNED ON DURING THE TEST AND DATA WAS INTERRUPTED.

APPROVAL: MRH SIGNATURE: Michael Holloway

HORNER EZY-CHEK

UST-IR
B-7

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 23, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#026	675	DIESEL	-.0057	
#033	1000	DIESEL	+.0026	
#028	675	DIESEL	-.0066	

REMARKS: TANKS AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME.

APPROVAL: MRH

SIGNATURE: Michael Holloway

HORNER EZY-CHEK

UST-IR
B-8

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374 OR (503) 624-0980

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 23, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#027	675	DIESEL	-.0072	
#029	675	DIESEL	-.0042	
#032	1000	DIESEL	-.0032	

REMARKS: TANKS AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME.

APPROVAL: DRH/MRH SIGNATURE: David R Hampton #12120

HORNER EZY-CHEK

UST-IR
B-9

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 24, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#013	1000	DIESEL	-.0048	
#012	2500	DIESEL	-.1670	

REMARKS: TANK #13 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. TANK SYSTEM #12 DOES NOT MEET TEST CRITERIA FOR OVER-FILL TESTING STANDARDS--NOT TIGHT.

APPROVAL: MRH

SIGNATURE: Michael Holloway

HORNER EZY-CHEK

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374 OR (503) 624-0980

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 24, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#014	1000	DIESEL	-.0108	

REMARKS: TANK AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME.

APPROVAL: DRH/MRH

SIGNATURE: [signature] #12120

HORNER EZY-CHEK

UST-IR
B-11

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER: DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON: FRED KOLBERG

ADDRESS: 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE: LINTHICUM, MD 21090

TELEPHONE: (410) 859-5049

TANK ADDRESS: UMDA

CITY, STATE: UMATILLA, OR

TEST METHOD: HORNER EZY-CHEK

TEST DATE: SEPTEMBER 25, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#009	3000	DIESEL	-.0058	
#010	1000	DIESEL	-.0021	

REMARKS: TANKS AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME.

APPROVAL: DRH/MRH SIGNATURE #12120 HORNER EZY-CHEK

UST-IR

B-12

EARTH SCIENCE TECHNOLOGY

TEST CERTIFICATE

TANK OWNER DAMES & MOORE/UMATILLA ARMY DEPOT ACTIVITY

CONTACT PERSON FRED KOLBERG

ADDRESS 849 INTERNATIONAL DRIVE, STE. 320

CITY, STATE LINTHICUM, MD 21090

TELEPHONE (410) 859-5049

TANK ADDRESS UMDA

CITY, STATE UMATILLA, OR

TEST METHOD HORNER EZY-CHEK

TEST DATE NOVEMBER 16, 1992

TANK	CAPACITY	PRODUCT	HIGH TEST	
#016	6008	DIESEL	-.0204	
#024	15,000	HT 5	-.0124	
#011	15,000	HT 5	NOT TESTABLE	
#018	15,000	HT 5	NOT TESTABLE	

REMARKS TANK #016 AND LINES PASSED THE TEST CRITERIA BASED ON THE ACCEPTABLE EPA STANDARDS FOR A TIGHT TANK AT THIS POINT IN TIME. #024 TEST WAS CONDUCTED AT 1" ABOVE TOP OF TANK PER REQUEST OF KEVIN PARRETT; #011 & #018 WERE NOT FILLED FOR TESTING WHEN TESTER ARRIVED--TESTS WERE CANCELLED.

APPROVAL DRH SIGNATURE [signature]

HORNER EZY-CHEK

UST-IR
B-13

8196 S.W. HALL BLVD. #210, BEAVERTON, OR 97005 ☐ (503) 643-5374

APPENDIX C

Geophysical Survey Methods and Results

GEOPHYSICAL SURVEY METHODS AND RESULTS

C.1 INTRODUCTION

Geophysical surveys were used to determine the presence or absence of 20 potential USTs at 14 locations where USTs were reported by former or current UMDA personnel. The surveys were conducted by Dames & Moore in September and October 1992. The geophysical surveys included the following USTs (listed by site):

- USTs 59, 60, 61, and 62 (Site 43)
- UST 64
- UST 65
- USTs 76 and 77
- UST 79
- UST 80
- UST 81
- UST 82
- UST 84
- UST 86
- USTs 88, 89, and 90
- UST 91
- UST 99 and
- UST 102.

As shown on Plates 1 and 2, four of the 14 UST sites (USTs 59, 60, 61, and 62; USTs 88, 89, and 90; UST 91; and UST 99) were located in the restricted area, and the remaining 10 sites were located in the Administration Area. (A geophysical survey was not performed at UST 100, because metal from the surrounding shelter and stored material would have interfered with the magnetic field measurements.)

Each geophysical survey consisted of a magnetometer survey and an EM survey. Magnetic and EM surveys were chosen because shallow, ferrous metallic USTs produce both readily identifiable magnetic and EM anomalies. Magnetometers and EM tools work on different principles and measure different properties and were used together to verify any observed anomalies.

The geophysical surveys consisted of the following sequential elements:

- Staking the reported location of the USTs.
- Establishment of a survey grid centered on the staked location of the USTs.
- Adjustment of the size of the survey grid to include additional suspect tank locations based on site evidence (i.e., possible vent brackets, asphalt patches, former boiler rooms, etc.).
- Production of a site map of the surveyed area to include cultural and natural features.
- Acquisition of both the magnetic and EM data.
- Processing and interpretation of the data, identifying any potential anomalies.
- Acquisition of additional data as needed.
- Marking the locations of geophysical anomalies in the field.

Details of the methods used are presented in the following narrative. Interpretation notes from each of the 14 UST sites and the referenced contour maps with survey grids are included in the remainder of this appendix.

Geophysical surveying techniques provide a cost-effective method to locate USTs in the absence of surface evidence such as fill pipes, vents, staining, surface depressions/mounds, etc. Because much of the information on these tanks was obtained from personal interviews, it is not certain whether the tanks actually existed

and were removed or were abandoned in place. Limited geophysical surveys, using magnetic and EM techniques, were performed at these locations to assess whether USTs or associated piping are present in the subsurface.

C.2 EQUIPMENT

C.2.1 EM Equipment

EM data were acquired using a Geonics DL55/31 Data Logging System with of the following components:

- Geonics EM31-DL noncontacting terrain conductivity meter
- Polycorder digital data logger
- Polycord programs.

The Polycord programs acquire and record survey data from the EM31-DL, under the control of the operator. The programs also record various field information such as survey line number, station number, recorded component comments, etc. The Polycord programs allow downloading of data from the Polycorder to a personal computer (PC).

The EM technique measures electrical properties of the earth by measuring the secondary magnetic field produced by induced electrical currents in the ground. A transmitter coil at one end of the EM31-DL induces circular eddy current loops into the earth that create a secondary magnetic field. Both the primary magnetic field (produced by the transmitter coil) and the secondary field induce a corresponding alternating current measured by a receiver coil. After backing out the primary field (which can be computed from the relative position and orientation of the coils), both the magnitude and relative phase of the secondary phase can be measured. These measurements can be converted to components in-phase and 90° out-of-phase with the transmitted field.

The out-of-phase (or quadrature-phase) component, using certain simplifying assumptions, can be converted to a measure of apparent ground conductivity. The in-

phase component, while not responsive to changes in bulk conductivity, is especially responsive to discrete, highly conductive bodies such as metal objects.

The spacing between the transmitter and receiver is 12 feet. The spatial resolution of the instrument is good, and conductivity differences of 5 percent can be resolved. The depth of investigation for the EM31-DL can exceed 20 feet.

C.2.2 Magnetometry Equipment

Magnetic data were recorded using a GEM GSM-19 Overhauser Memory Magnetometer Gradiometer. The GSM-19 is a proton precession magnetometer with a microprocessor-based digital data acquisition system that allows for simultaneous measurement of total magnetic field intensity at two heights on a survey staff. The system provides for recording both the total magnetic intensity and the vertical magnetic gradient.

In a proton precession magnetometer, an excitation voltage is applied to a coil around a bottle containing a fluid such as kerosene. The induced field reorients the protons in the fluid, and when the excitation voltage is removed, the spinning protons reorient to line up with the earth's magnetic field. By nuclear precession, the protons generate a signal, the frequency of which is proportional to the strength of the magnetic field. The signal is amplified, and the precession frequency is measured by the use of counter microprocessing circuitry. The frequency is translated into Gammas or Teslas, and the output is fed to a digital display and a digital memory. The microprocessor also allows the recording of various field information such as survey line number and station number. The data can be downloaded from the microprocessor to a PC. Both the total magnetic field and the magnetic gradient can be used to attempt to identify buried ferrous metallic objects. The lower GSM-19 magnetometer has a fixed ground clearance of 7.35 feet. The upper sensor has a fixed ground clearance of 9.19 feet.

C.2.3 Surveying Equipment

A survey grid was established at each of the 14 sites over the reported location of the USTs. The grids were established using a Brunton compass, two 300-foot measuring tapes, spray paint, and wooden stakes.

C.2.4 Processing and Interpretation Equipment

The EM and magnetometer data were downloaded to a PC. Data were processed and contour maps were generated using Golden Software's SURFER program. High-resolution, two-dimensional plots of both the magnetic and EM data were produced for each site (see the end of this appendix).

C.3 METHODS

C.3.1 Establishing Survey Grids

The reported locations of the USTs were staked in the field based on information from former or current UMDA personnel. The size of the survey grids and grid spacing were dependent on site-specific information. At sites where a specific location of an UST was reported, the size of the survey grid was limited. In these cases, the grid was centered around the reported UST location and then expanded to encompass nearby suspected areas. Suspect evidence included vent brackets, pavement patches, and proximity to boiler/furnace rooms. The size of these survey grids varied from 4,275 (UST 79) to 22,000 square feet (USTs 76 and 77). The line and station spacing established in the grids was 5 feet.

At sites where the reported UST location was uncertain and where no buildings or structures were present, the size of the survey grid was expanded relative to the other grids. The survey grids at the sites varied from 40,000 (USTs 59, 60, 61, and 62; UST 86; and UST 91) to 60,000 square feet (USTs 88,89, and 90). Except for UST 86, the line and station spacing established in these grids was 10 feet. A 200- by 200-foot grid was established around the reported location of UST 86. A 10-foot line and

station spacing was established in the grids. A 5-foot line and station spacing was established in the central 100- by 100-foot portion of the grid.

The survey grids were established using a Brunton compass and two 300-foot tapes. No elevations were measured because the sites were essentially level. The local horizontal (x,y) coordinates were based on cartesian coordinates in feet east and north of the 100/100 coordinate located in the southwest corner of the grid. Location accuracy is estimated to be within 2 feet. After the baselines were established, diagonal grid corners were measured and adjusted. The baseline and interior 50-foot survey nodes were marked by stakes. Stations were marked on the ground by spray paint.

C.3.2 Acquiring Geophysical Data

Base stations were established for each of the two geophysical tools in the vicinity of the each survey grid. The geophysical tools were periodically checked for instrument drift and magnetic diurnal variation during the survey at the base stations. The data were corrected for instrument drift and diurnal variations during processing.

Magnetic data were acquired at each station. The GSM-19 recorded the line number, station number, total magnetic field reading, and the vertical magnetic gradient. At stations where cultural interference did not allow a magnetometer reading to be recorded, a "no data" entry was made.

EM data were also acquired at each station. The following EM parameters were recorded:

- East-west orientation in-phase
- East-west orientation quadrature component
- North-south orientation in-phase
- North-south orientation quadrature component.

At stations were cultural interference did not allow EM readings to be recorded, a "no data" entry was made.

The geophysical data were downloaded to a PC at the end of each workday for storage and processing.

C.3.3 Processing Geophysical Data

Once the geophysical data were downloaded, the files were labeled, inspected, and edited. Drift corrections were applied to the magnetic data as needed. The data files were edited for SURFER compatibility, and contour maps were created.

Two data sets were created from the magnetometer data acquired from each UST site--a total magnetic field intensity set and a vertical magnetic gradient set. Contour maps were created for each of the two data sets.

Eight data sets were created from the EM data acquired from each UST site. The data sets include the following parameters:

- East-west orientation in-phase
- East-west orientation conductivity (quadrature component)
- North-south orientation in-phase
- North-south orientation conductivity (quadrature component)
- Sum of in-phase data
- Sum of conductivity (quadrature component) data
- Difference of in-phase data
- Difference of conductivity (quadrature component) data.

Four of the eight EM data sets were used for interpretation at each of the 14 UST sites. These data sets include:

- EM north-south in-phase readings
- EM north-south conductivity
- EM in-phase difference
- EM conductivity difference.

These data sets appeared to best display EM anomalies based on site test survey data.

C.4 TEST SURVEY

Prior to conducting the geophysical surveys at the 14 UST sites, a test survey was completed over a known tank at the facility (UST 34). The purpose of the test survey was to evaluate the response of the EM31-DL and GSM-19 and to evaluate which of the eight EM parameters best define the location of the known UST.

Results from the test survey at UST 34 indicated that the EM in-phase difference parameter was the most definitive of the eight EM parameters for estimating the location of an UST. The EM in-phase component is especially responsive to discrete highly conductive bodies such as USTs. By computing the difference between the north-south and east-west EM in-phase orientations, anomalous signals were enhanced relative to canceled background.

Results from the test survey at UST 34 also indicated that EM in-phase readings were useful for estimating the location of USTs. As a matter of convention, EM north-south in-phase and EM north-south conductivity readings were mapped rather than EM east-west in-phase and EM east-west conductivity readings. Although results from the test survey at UST 34 did not indicate that EM conductivity difference was a definitive parameter, conductivity difference maps were used in each of the 14 site interpretations.

The vertical magnetic gradient appeared to be the more definitive of the two magnetometer data sets for locating USTs based on test survey data. Shallow magnetic targets are enhanced in the vertical magnetic gradient data relative to total magnetic intensity data.

C.5 DATA INTERPRETATION

Both EM and magnetic data were evaluated for the presence of anomalies. EM and magnetic anomalies were identified as areas of elevated contoured values. The locations of the anomalies were compared to the site maps; anomalies that corresponded to mapped cultural interference were disregarded. Linear anomalies were also disregarded as buried utilities. Magnetic anomalies that were not confirmed by

EM data were attributed to basaltic boulders in the soil or fill material at certain UST sites. The remaining anomalies were compared to anomalies identified in other maps from that site.

The relative magnitude of the remaining anomalies was subjectively characterized as weak, moderate, or strong. The relative size of the anomalies was evaluated and compared to the expected size of an UST. Based on these interpretation parameters, a decision was made concerning the likelihood of the presence of an UST.

Cultural interference from fences, buildings, transformers, poles, underground utilities, and other manmade features can mask the presence of possible geophysical targets. The area in the vicinity of such features cannot be interpreted to the same degree of certainty as areas not affected by cultural interference. Although, limiting cultural interference was encountered at several of the 14 UST sites, it was restricted to only a portion of the surveyed area.

C.6 GENERAL SITE CONDITIONS

As observed during the geophysical surveys, the general site conditions for the 10 potential UST sites in the Administration Area included landscaping, pasture, asphalt, and open areas with scattered grass and low brush. The relief at the UST sites was minor. The amount of cultural interference (buildings, underground utilities, overhead lines, fences, etc.) encountered at the potential UST sites in the Administration Area varied from minor to significant.

Three of the four potential UST sites in the restricted area were open areas covered by scattered grass and low brush. UST 99 was located between two warehouses in the southwest corner of UMDA, where site conditions were observed to be partial asphalt and open ground cover. The amount of relief at the potential UST sites in the restricted area was also minor. The amount of cultural interference was generally minor, except at UST 99, where structures and overhead lines were encountered.

No direct surface evidence of USTs was found at any of the potential UST sites. Direct evidence includes features such as vent pipes and fill ports.

INTERPRETATION NOTES
USTs 59, 60, 61 & 62
Site 43

I. SITE MAP

- 200'x200'grid, 10'spacing

- No indication of USTs based upon surficial evidence.

II. MAGNETOMETER DATA

- Moderate to weak anomaly in both vertical gradient and total field data centered N210/E190. Anomaly does not appear in EM data. Anomaly is not attributed to UST because of the following reasons:

  1) Size and strength of anomaly

  2) EM data do not indicate occurrence of UST

- It should be noted that the magnetic data did not suffer from the cultural interfernce encountered at the site as did the EM in-phase and conductivity data.

III. EM DATA

In-Phase Data

- No indication of targets.

Conductivity Data

- No indication of targets.

IV. CONCLUSIONS

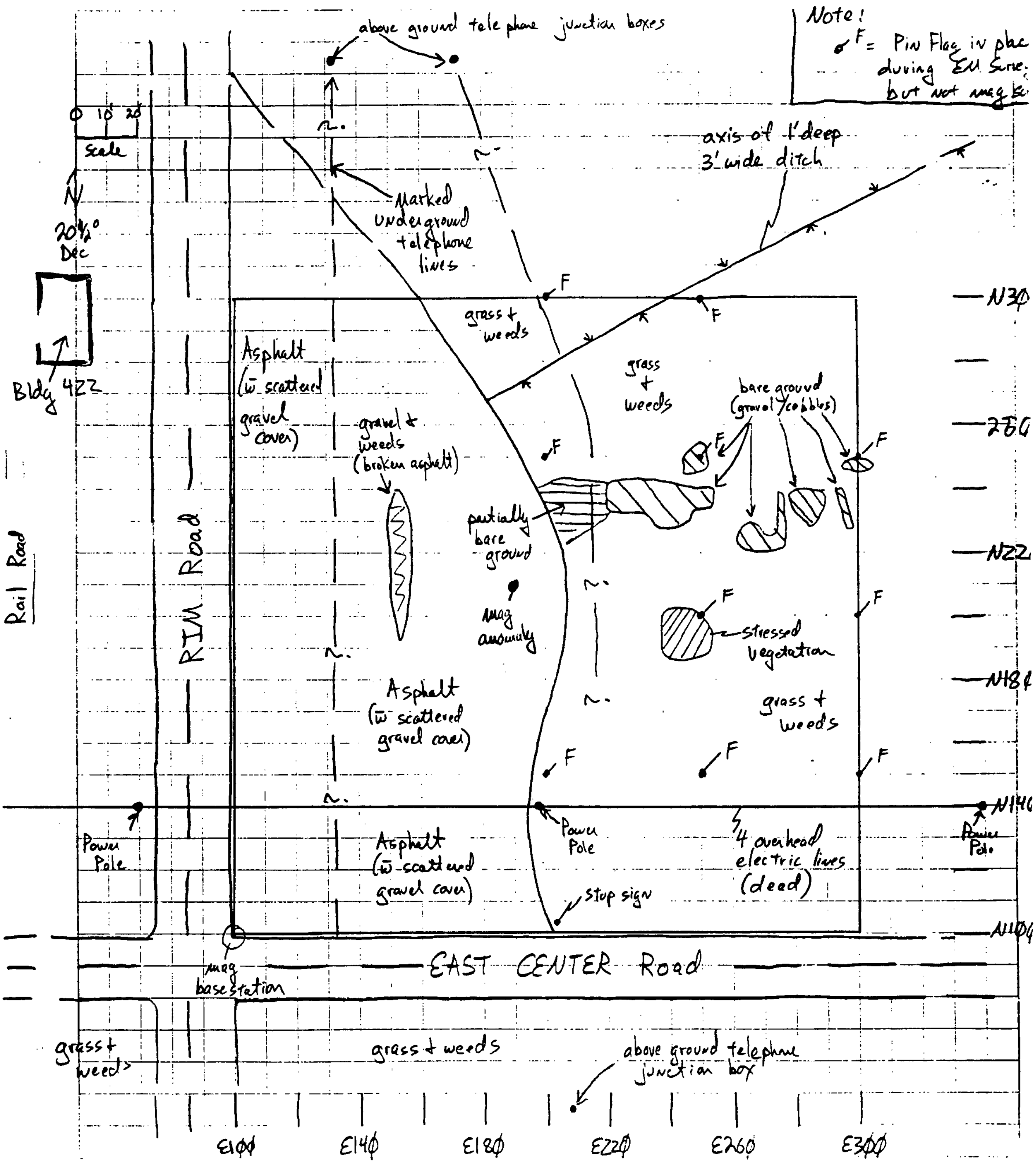
- No geophysical targets that can't be attributed to cultural interference.

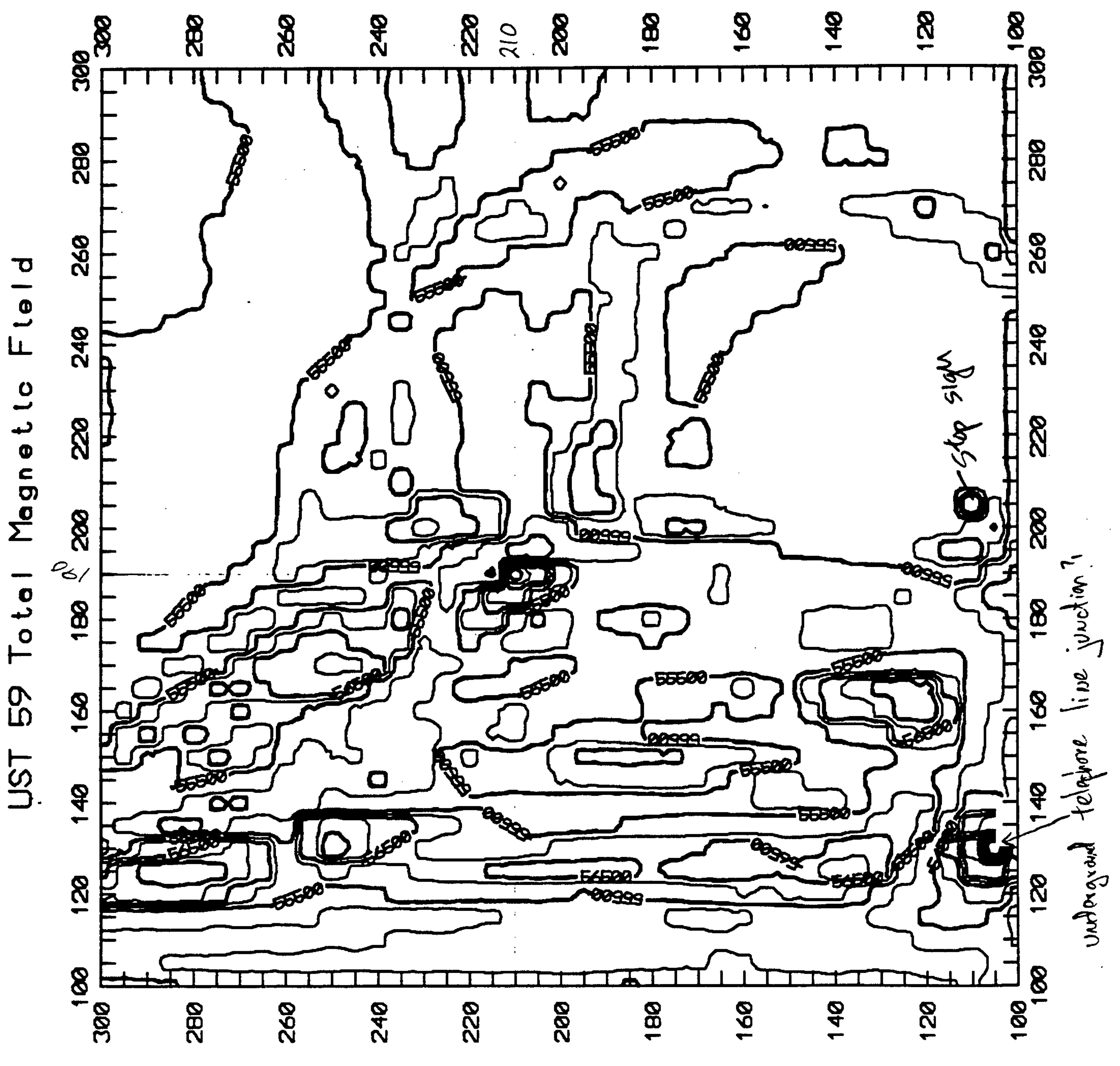
Site 43 UST 59...

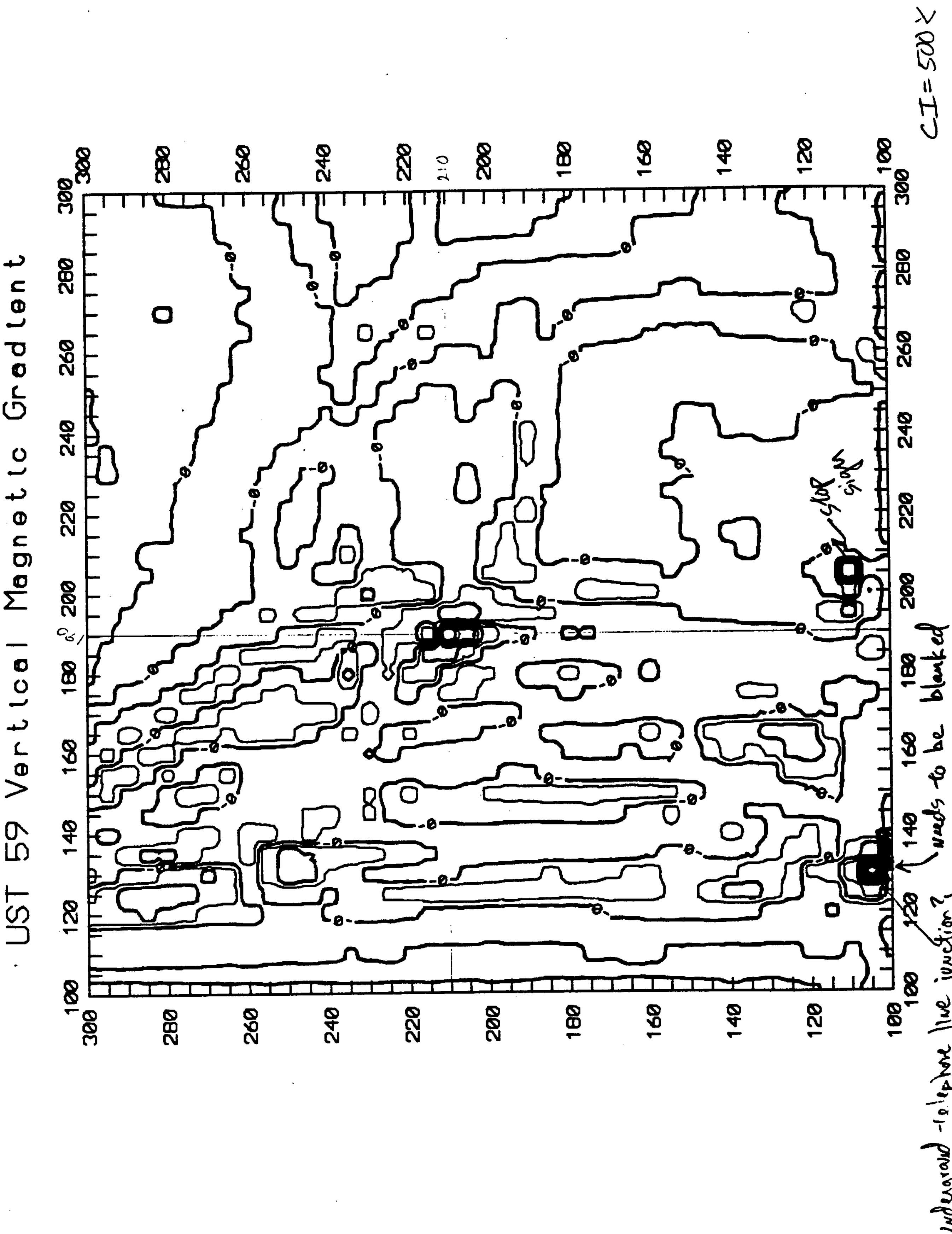
DAMES & MOORE A PROFESSIONAL LIMITED PARTNERSHIP

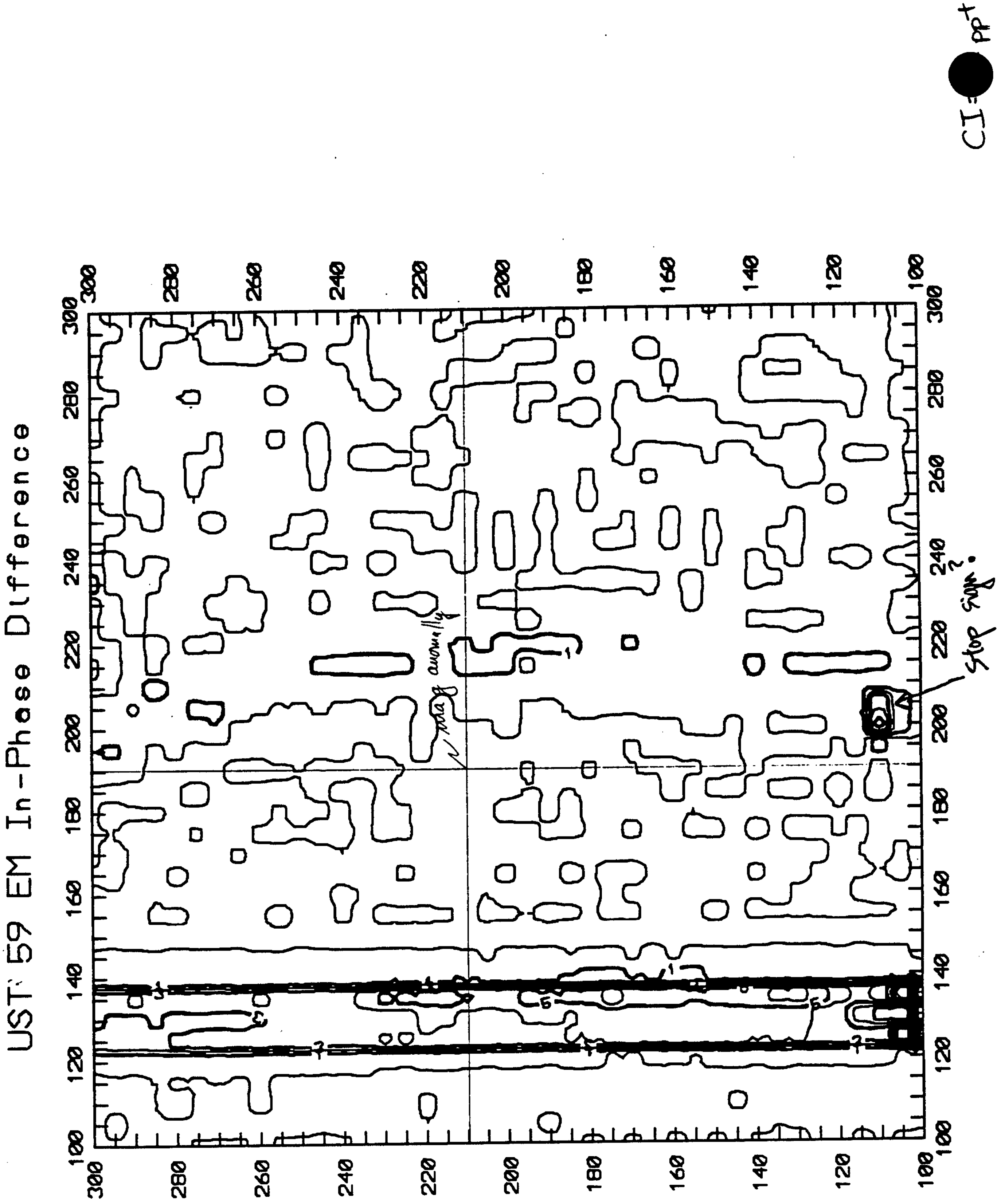
SITE MAP

Job No.	Job	Sheet No.
Client	Subject	Calc. No.
		Rev. No.
		By Date 9/18
		Chk'd. Date

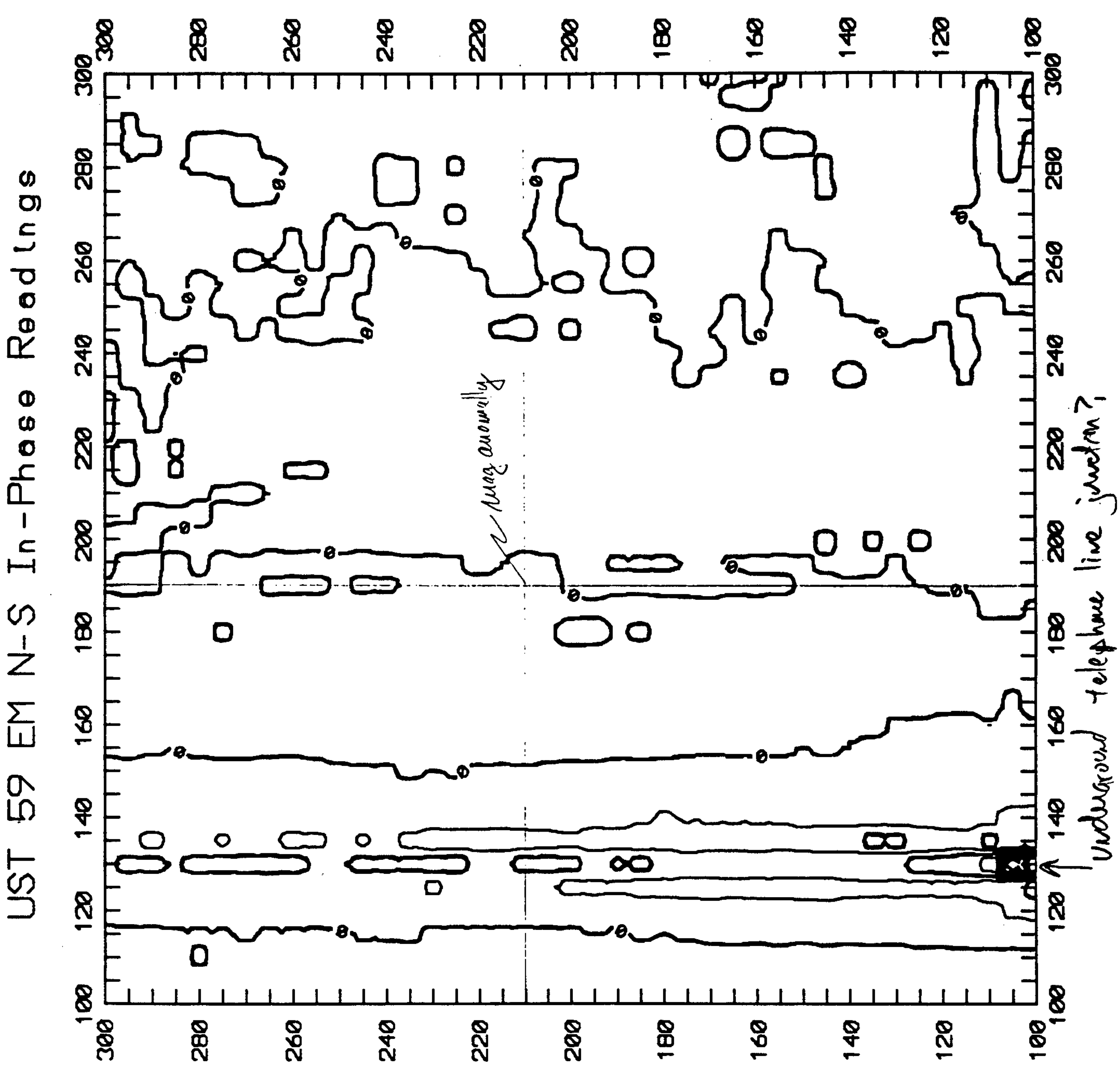



UST 59 Total Magnetic Field
Stop sign
Underground telephone line junction?
210
190

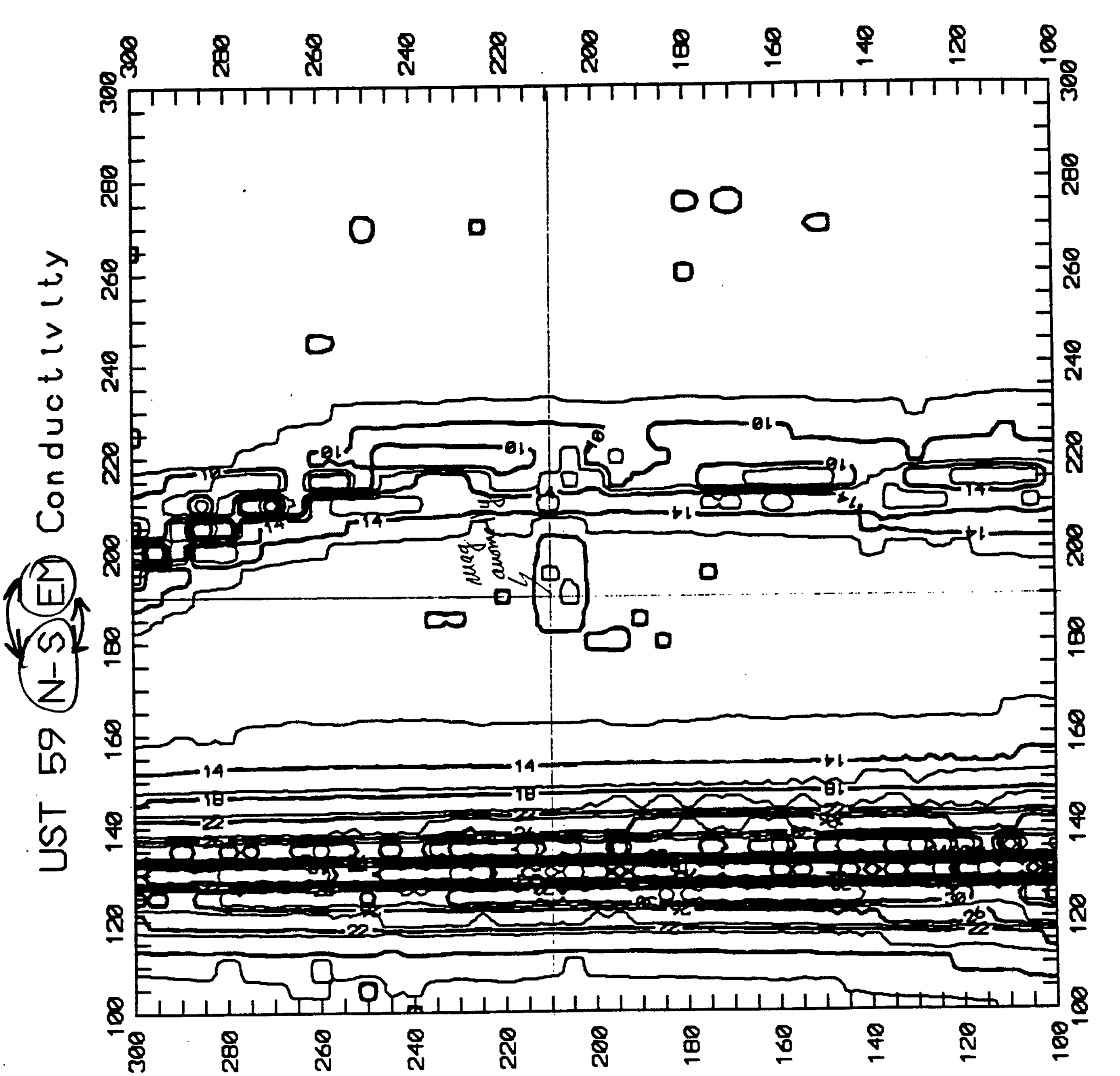

UST 59 Vertical Magnetic Gradient
CI = 500 γ
steel sign
needs to be blanked
underground telephone line junction?

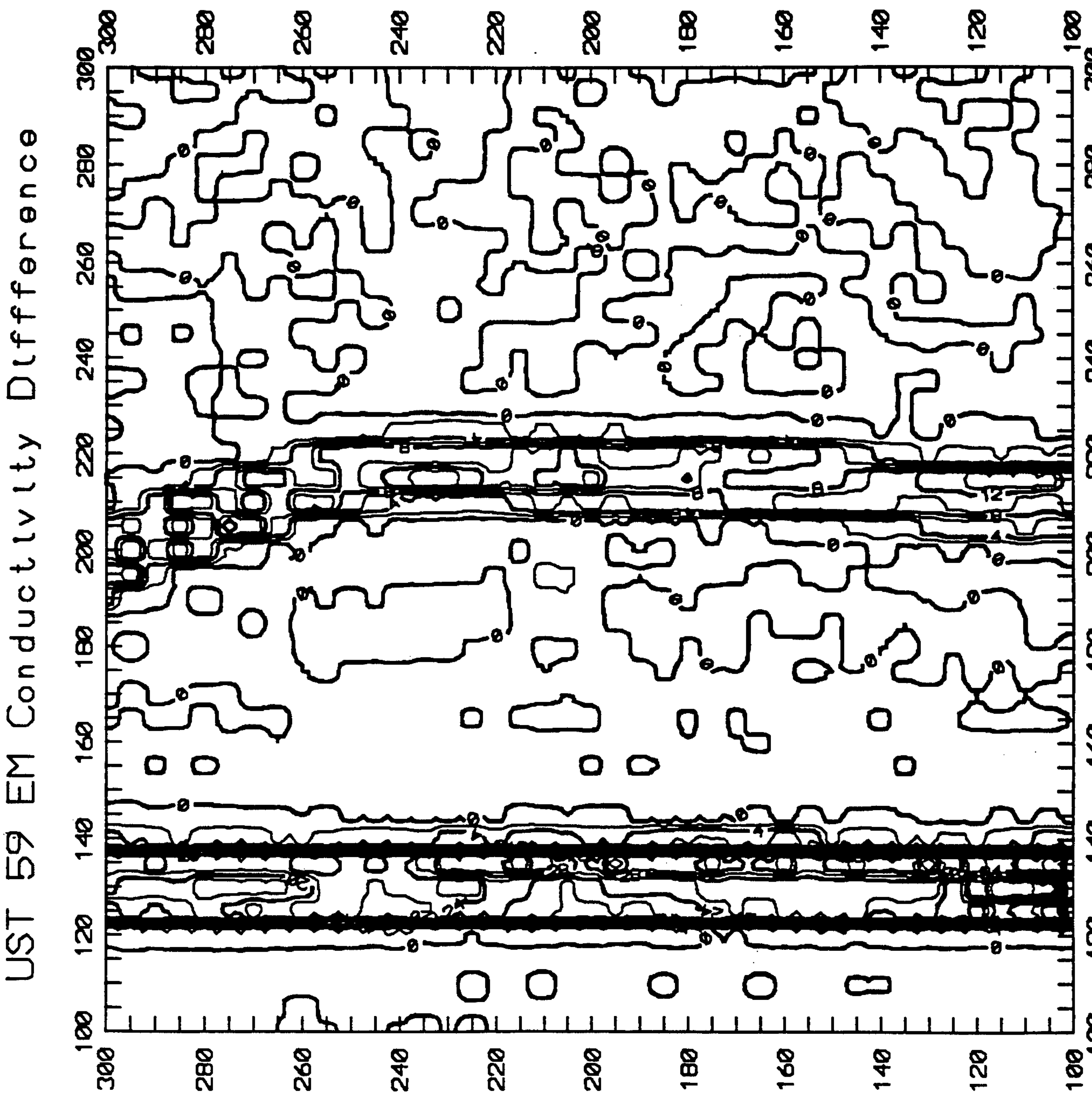

UST 59 EM In-Phase Difference
data anomally
stop sign?
CI = ● ppt

CI = 2 ppt



UST 59 EM N-S In-Phase Readings
mag anomaly
underground telephone line junction?


UST 59 N-S EM Conductivity
mag anomaly
C.I. = mmho/



CI = 2 mmho/m

INTERPRETATION NOTES
UST 64

I. SITE MAP

- 80'x100' grid, 5' spacing

- No indication of USTs based upon surficial evidence.

- According to the Work Plan, Building 84 is located near the reported site of UST 64. However, when we were acquiring the geophysical data, Building 84 was not found in the area. Rather, Building 328 was found in the approximate location of where the Work Plan located Building 84.

- Building 328 is on skids and appears to have been in place for at least several years. There is a slight chance that Building 328 is covering the location of UST 64. The building created enough interference that allowed us to only approach the structure, and not acquire data in the immediate vicinity.

II. MAGNETOMETER DATA

- The magnetic anomalies observed in both data sets appear to be associated with underground utilities or Building 328.

- Possible magnetic target located N100-110/E120-140. Anomaly does not appear in EM data. Anomaly is not attributed to UST because of the following reasons:]
  1) Size and strength of anomaly
  2) EM data do not indicate occurrence of UST
  3) In line with possible buried utuilty.

III. EM DATA

<u>In-Phase Data</u>

- The EM In-Phase anomalies observed in the data sets appear to be associated with underground utilities or Building 328.

<u>Conductivity Data</u>

- The EM Conductivity anomalies observed in the data sets appear to be associated with underground utilities or Building 328.

IV. CONCLUSIONS

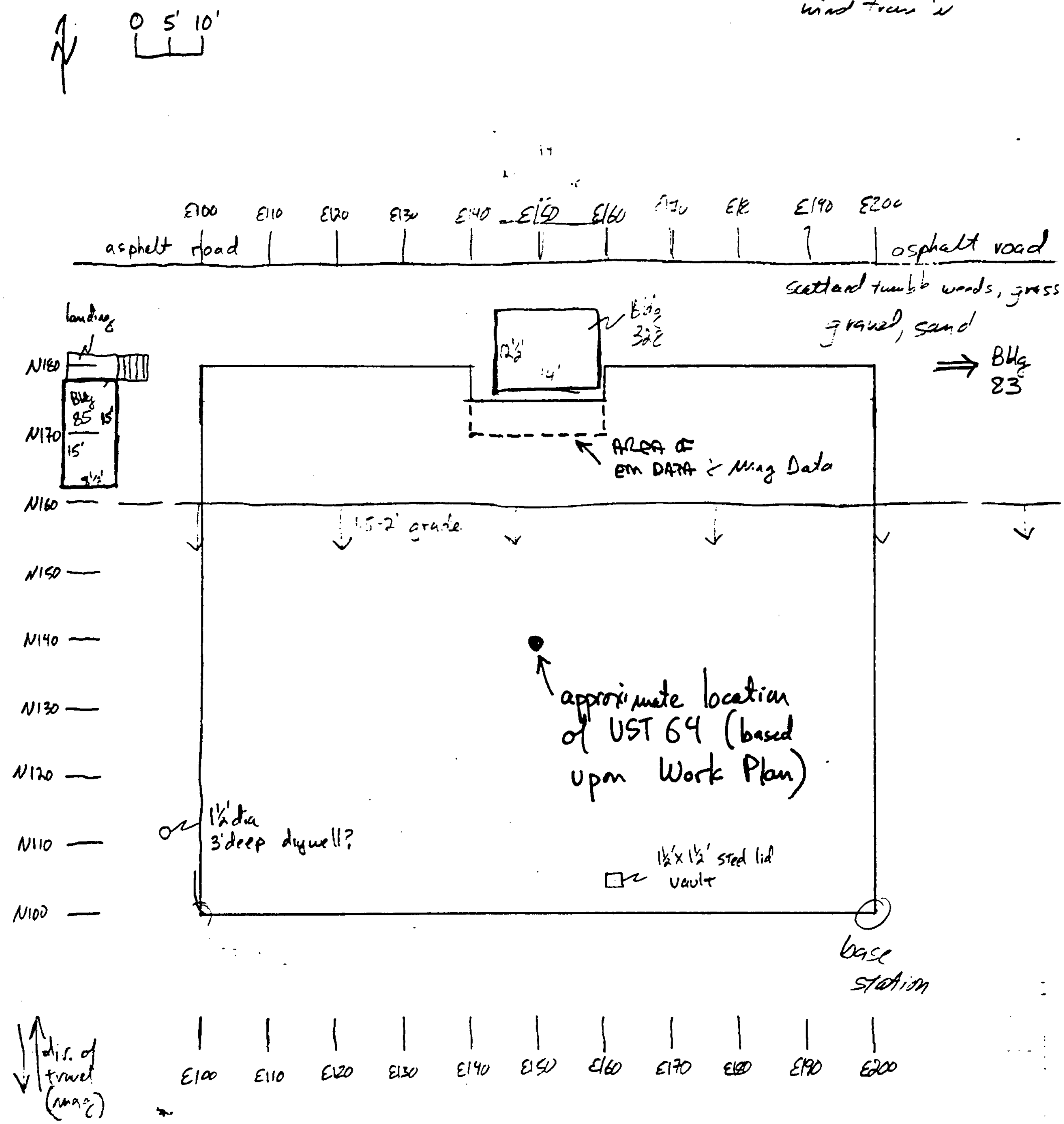
- No geophysical targets that can't be attributed to cultural interference.

- Interference in the vicinity of Building 328. The possible presence of a UST under Building 328 has not been evaluated.

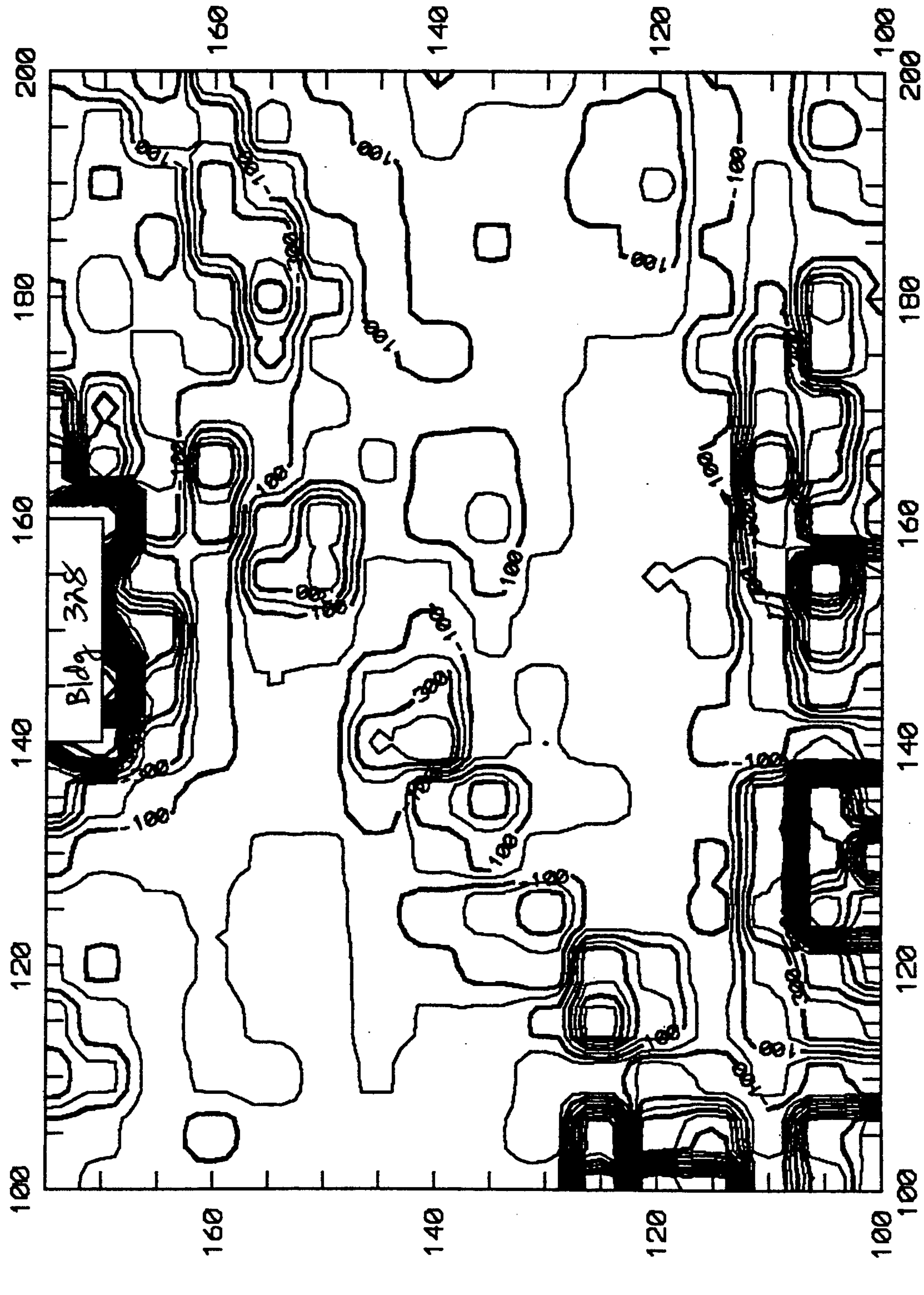
DAMES & MOORE

Sheet No.		
Calc. No.		
Rev. No.		
Job No.	Job UST 64	By	Date 9/13/92
Client	Subject	Chk'd.	Date

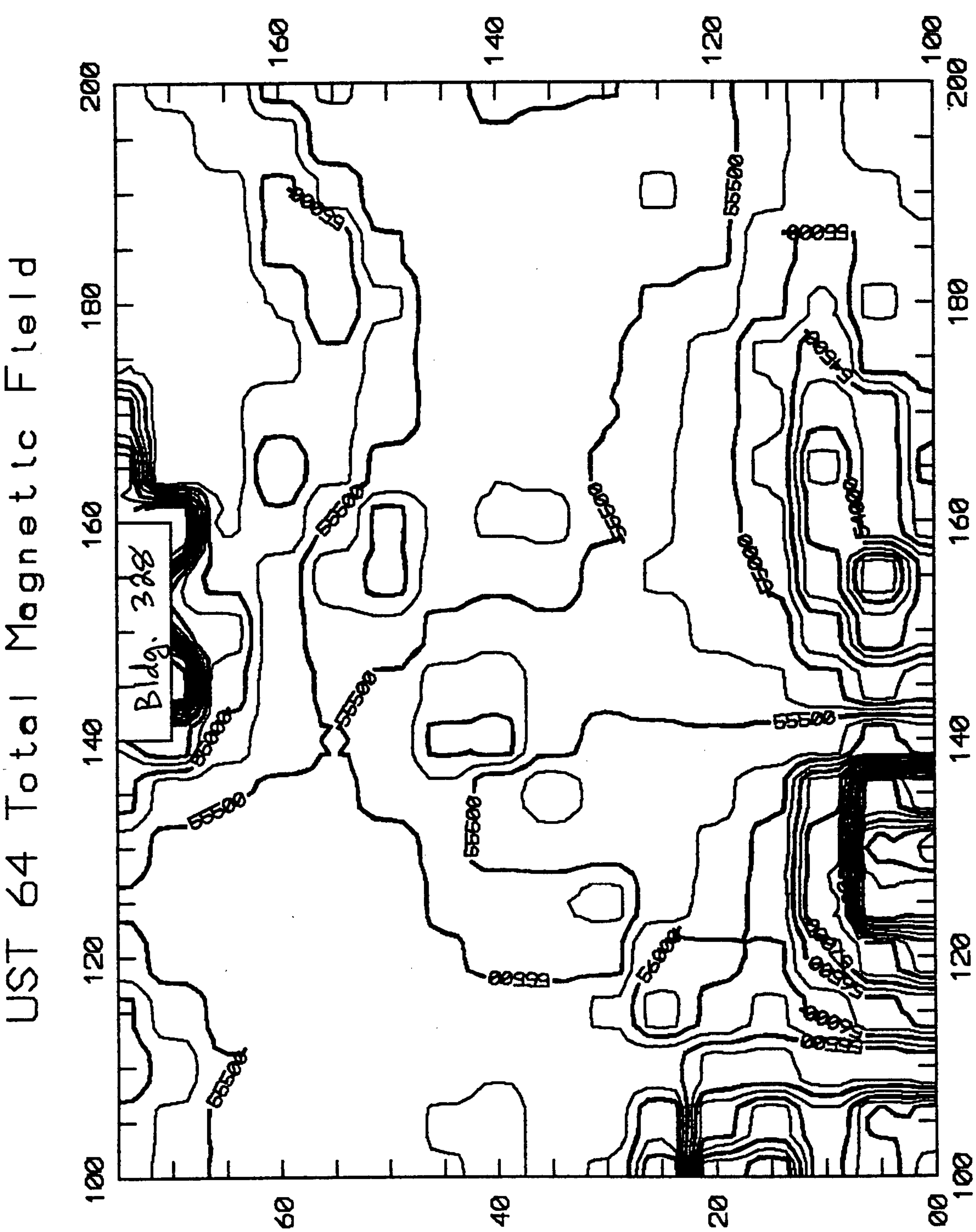
weather: 4:00PM 75°, sunny 10-15 mph wind from W

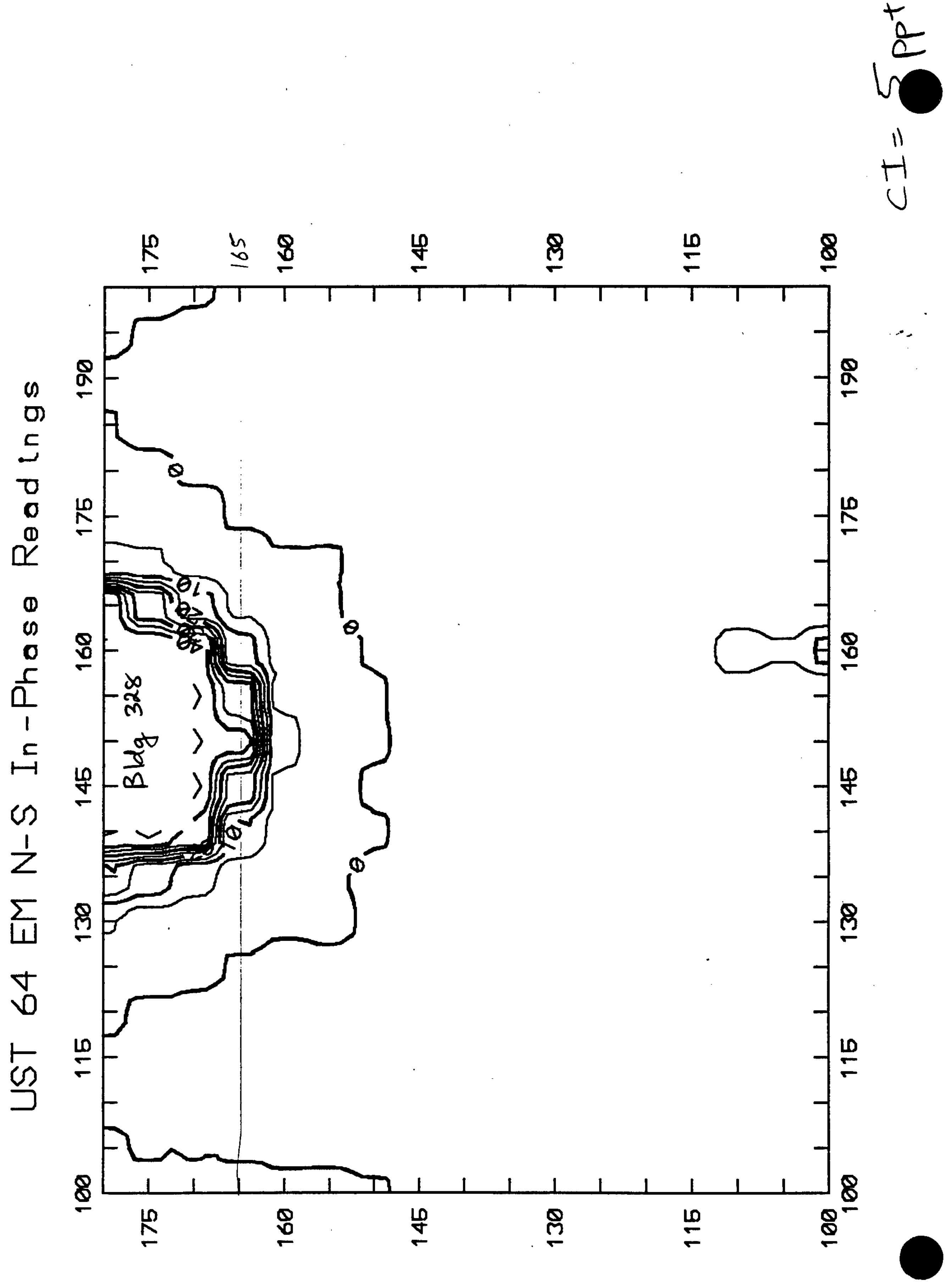


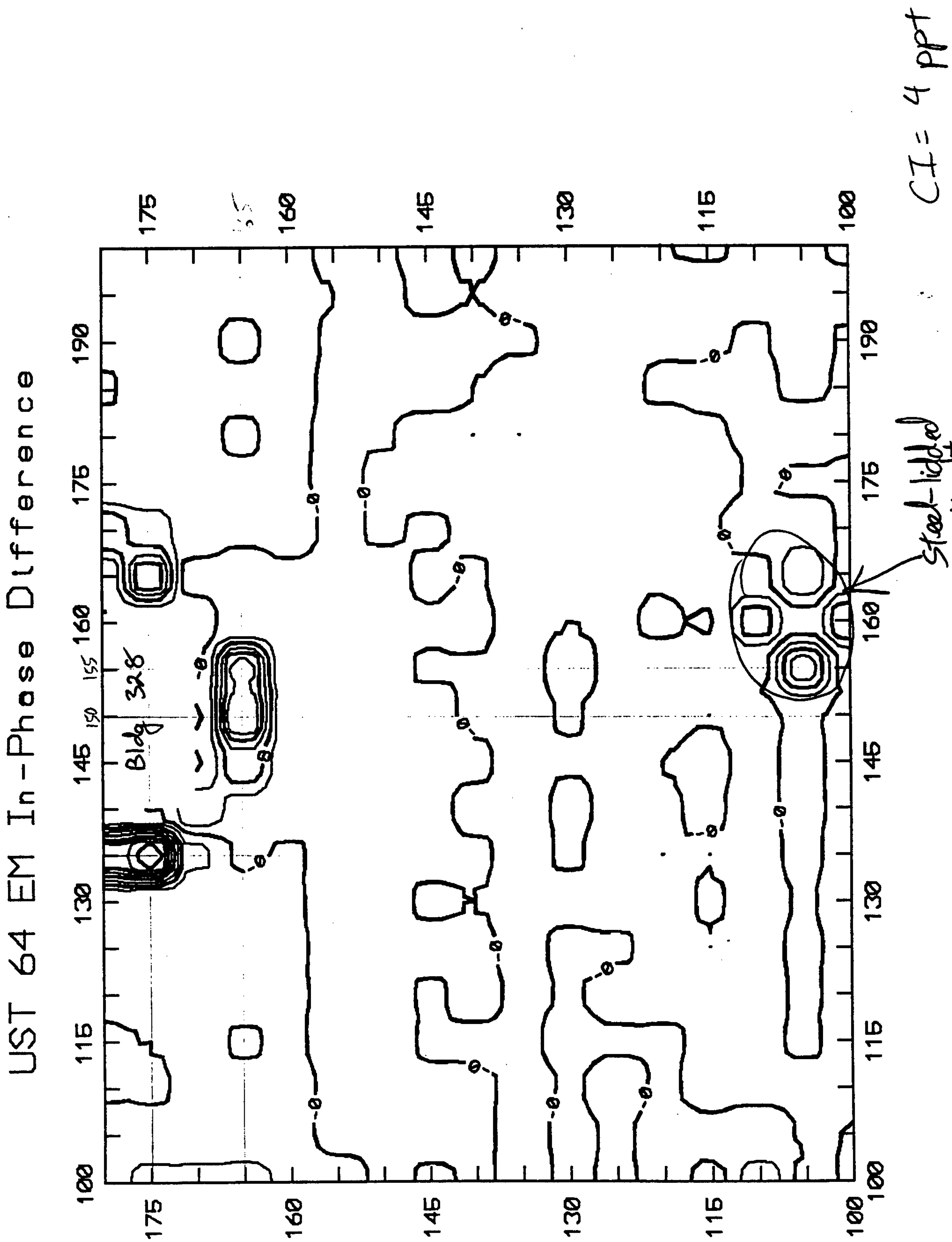
UST 64 Vertical Magnetic Gradient

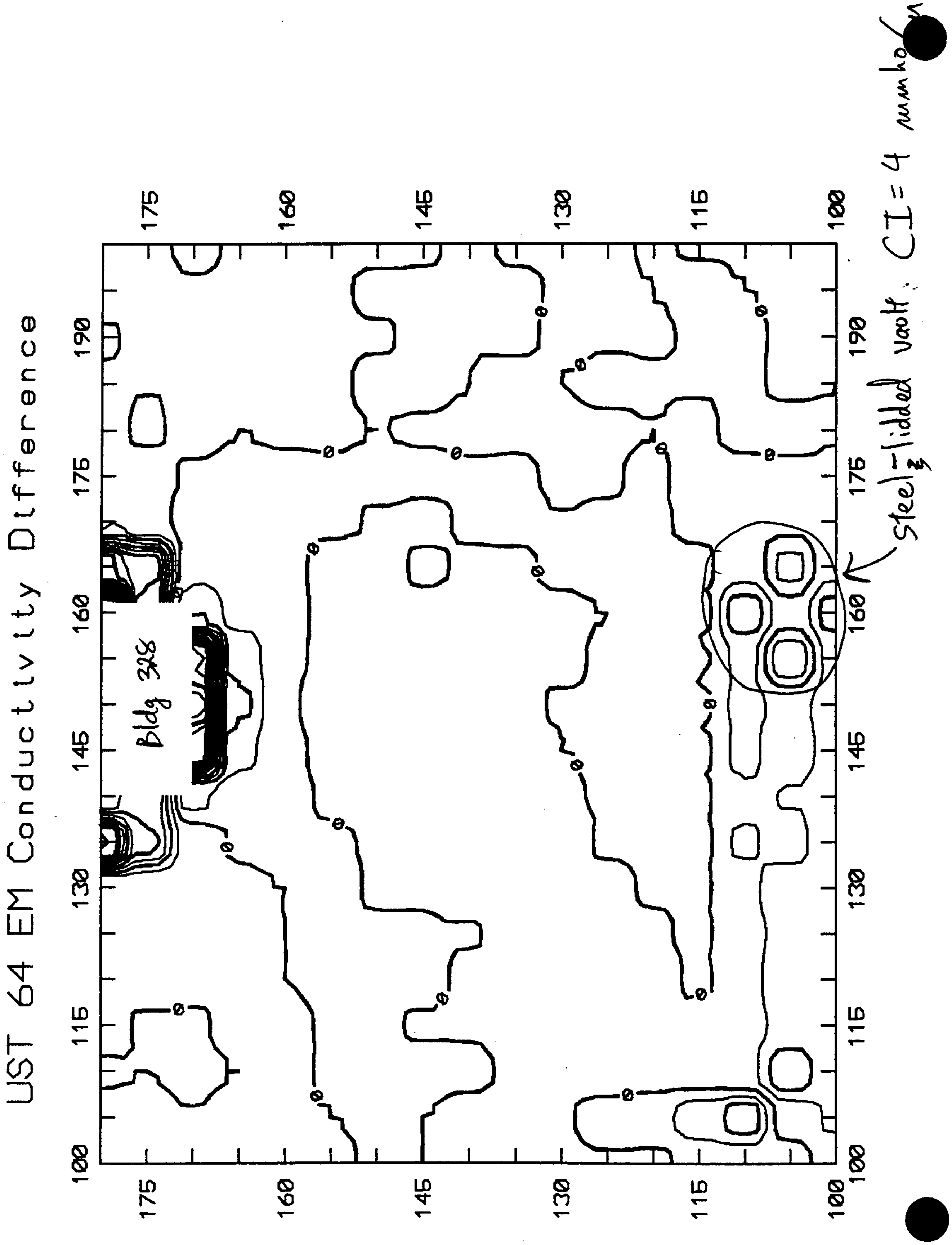


CI = 100 γ


UST 64 Total Magnetic Field
Bldg. 328
55500
56000
54000
100
120
140
160
180
200

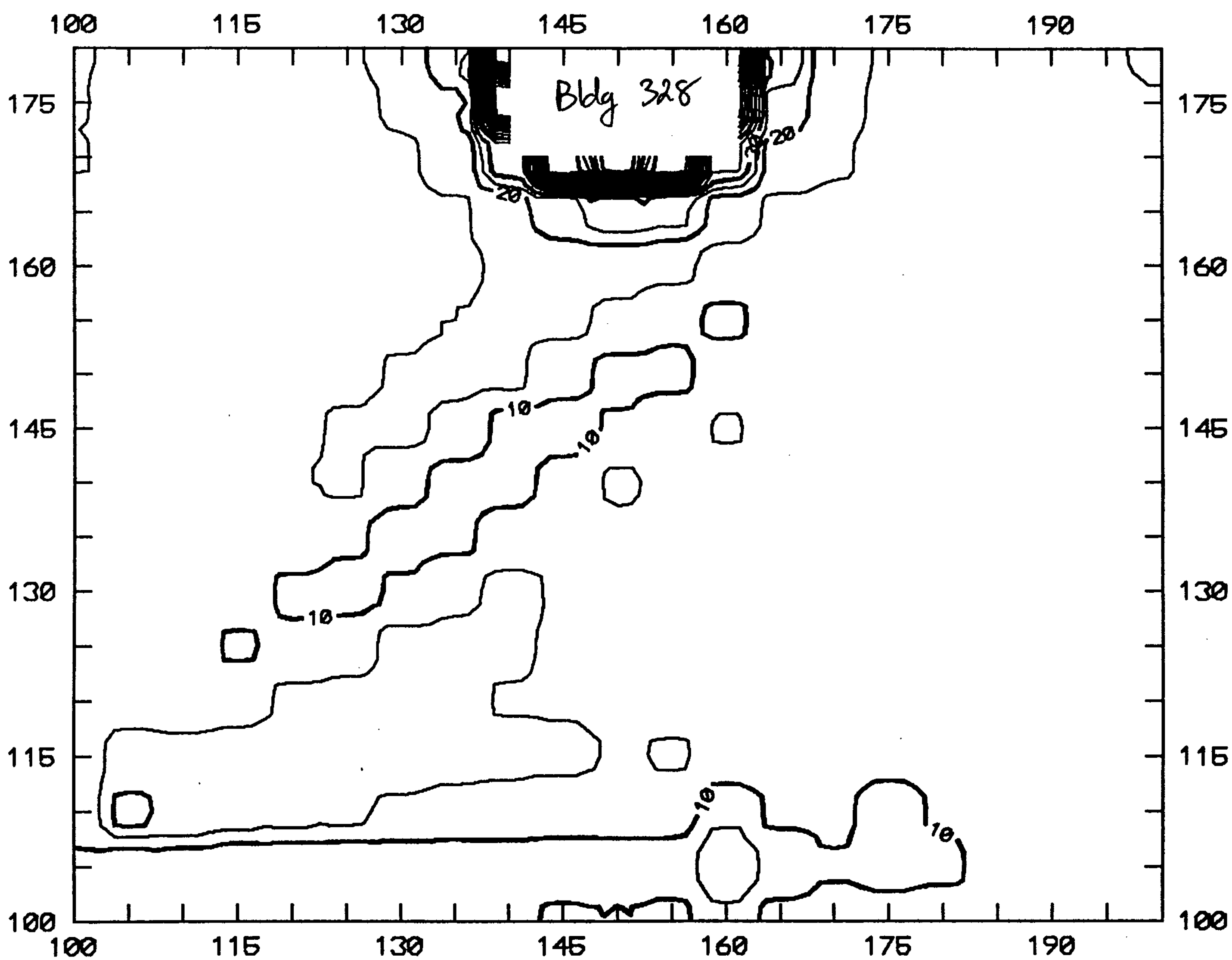

UST 64 EM N-S In-Phase Readings
CI = 5 ppt
Bldg 328
165
100
115
130
145
160
175
190


UST 64 EM In-Phase Difference
CI = 4 ppt
Bldg 328
Steel-lidded vault



UST 64 EM Conductivity Difference
Bldg 328
steel-lidded vault
CI = 4 mmho/m
100
115
130
145
160
175
190

UST 64 EM N-S Conductivity



CI= 5 mmho/m

INTERPRETATION NOTES
UST 65

I. SITE MAP

- 100'x95' grid, 5' spacing
- Little indication of USTs based upon surficial evidence.
  - Asphalt patch centered at N120/E170 may have been the former location of a small UST.
- The reported location of UST 65 in the Work Plan proved problematic because of the inaccuracies of the Work Plan map.
- The site contained a good deqal of cultural interference due to underground utilities and fences. The fences an utilities caused some interference.

II. MAGNETOMETER DATA

- Several moderate to weak magnetic anomalies occur west of the fence. Two of these anomalies are centered N150/E145 and N175/E145. These anomalies appear to be associated with underground utilities or interference from the fence.

III. EM DATA

UST-IR
B-18

In-Phase Data

- The EM In-Phase anomalies observed in the data sets appear to be associated with underground utilities or the fence.

Conductivity Data

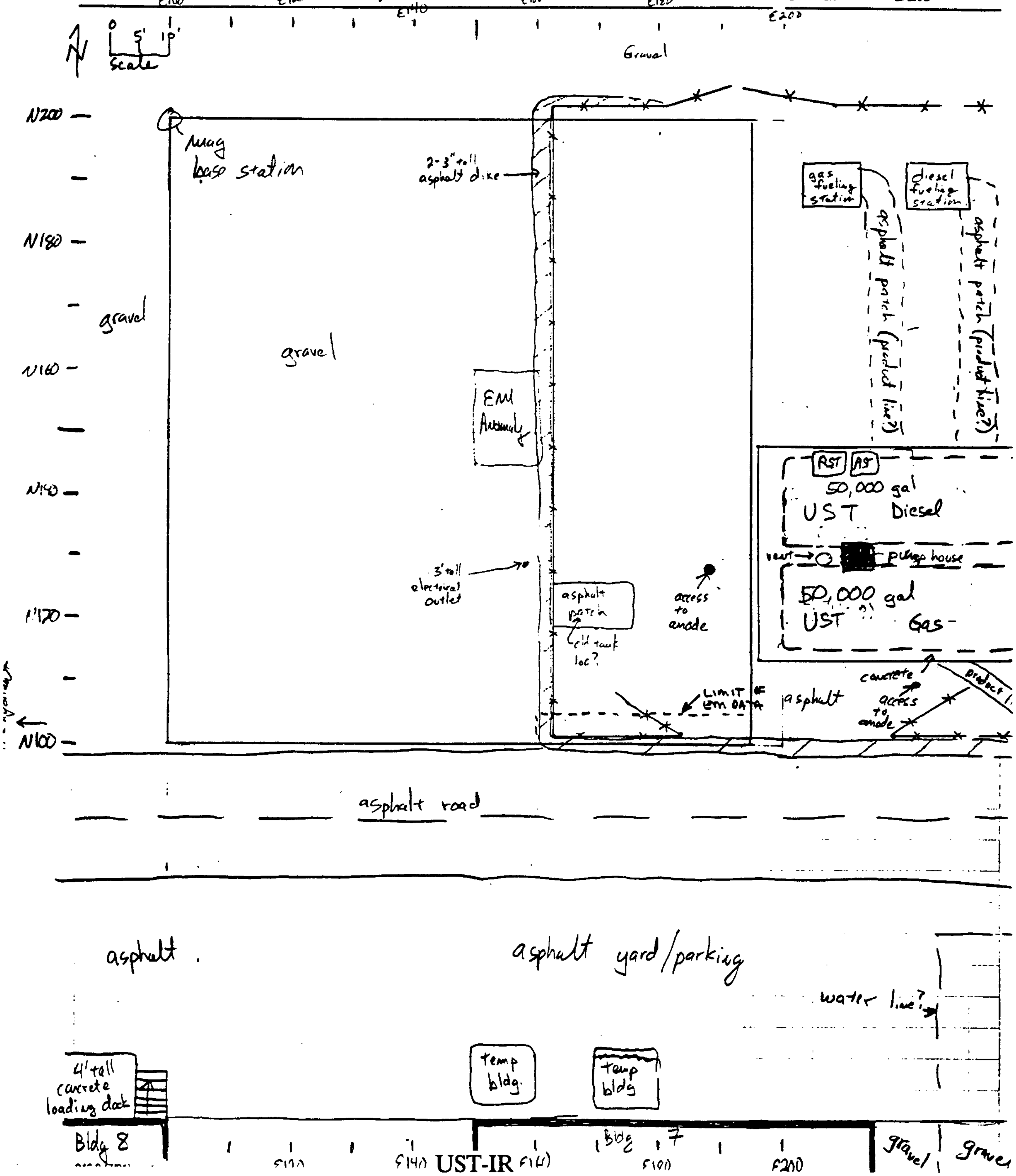
- The EM Conductivity anomalies observed in the data sets appear to be associated with underground utilities or the fence.

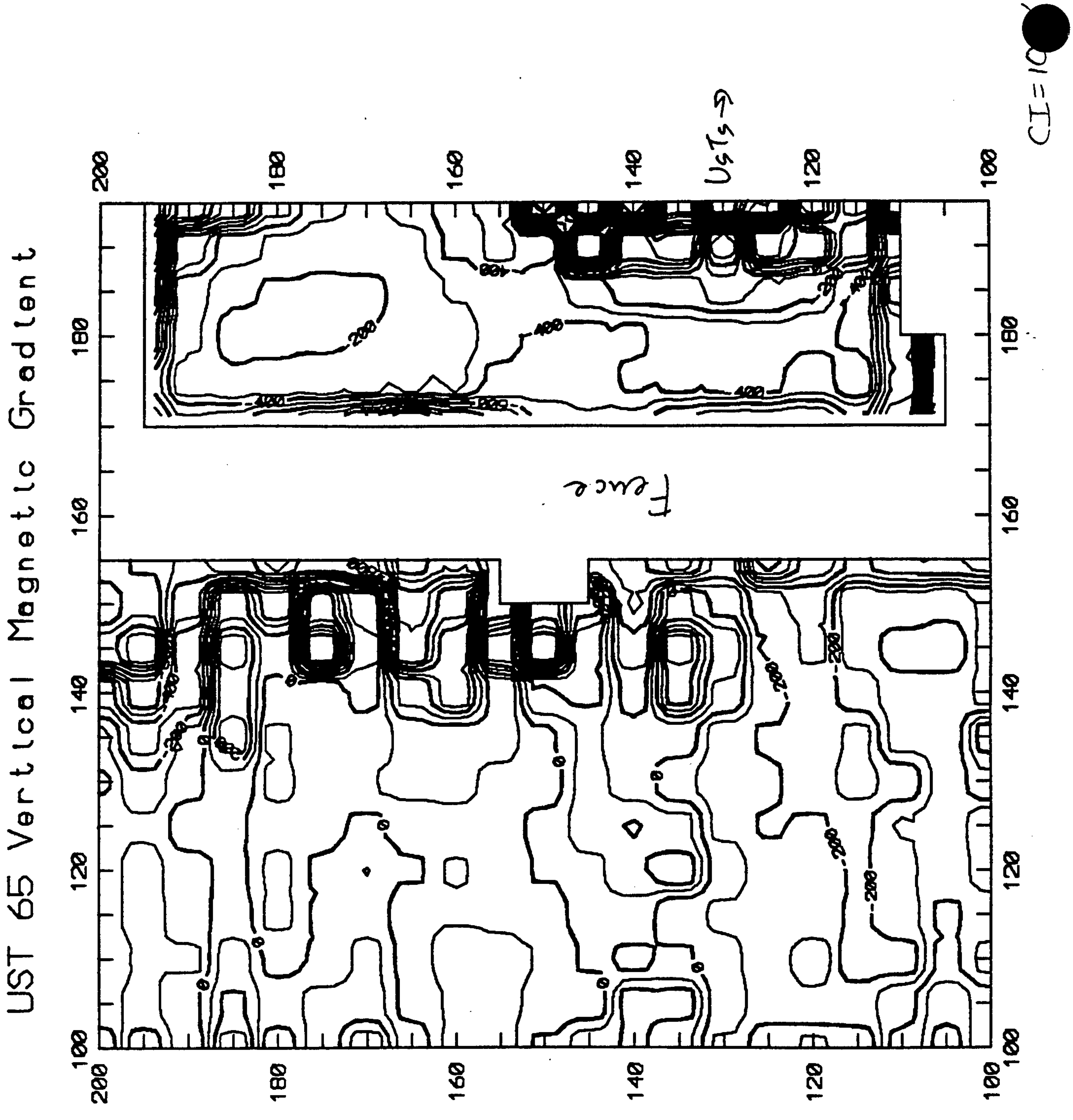
IV. CONCLUSIONS

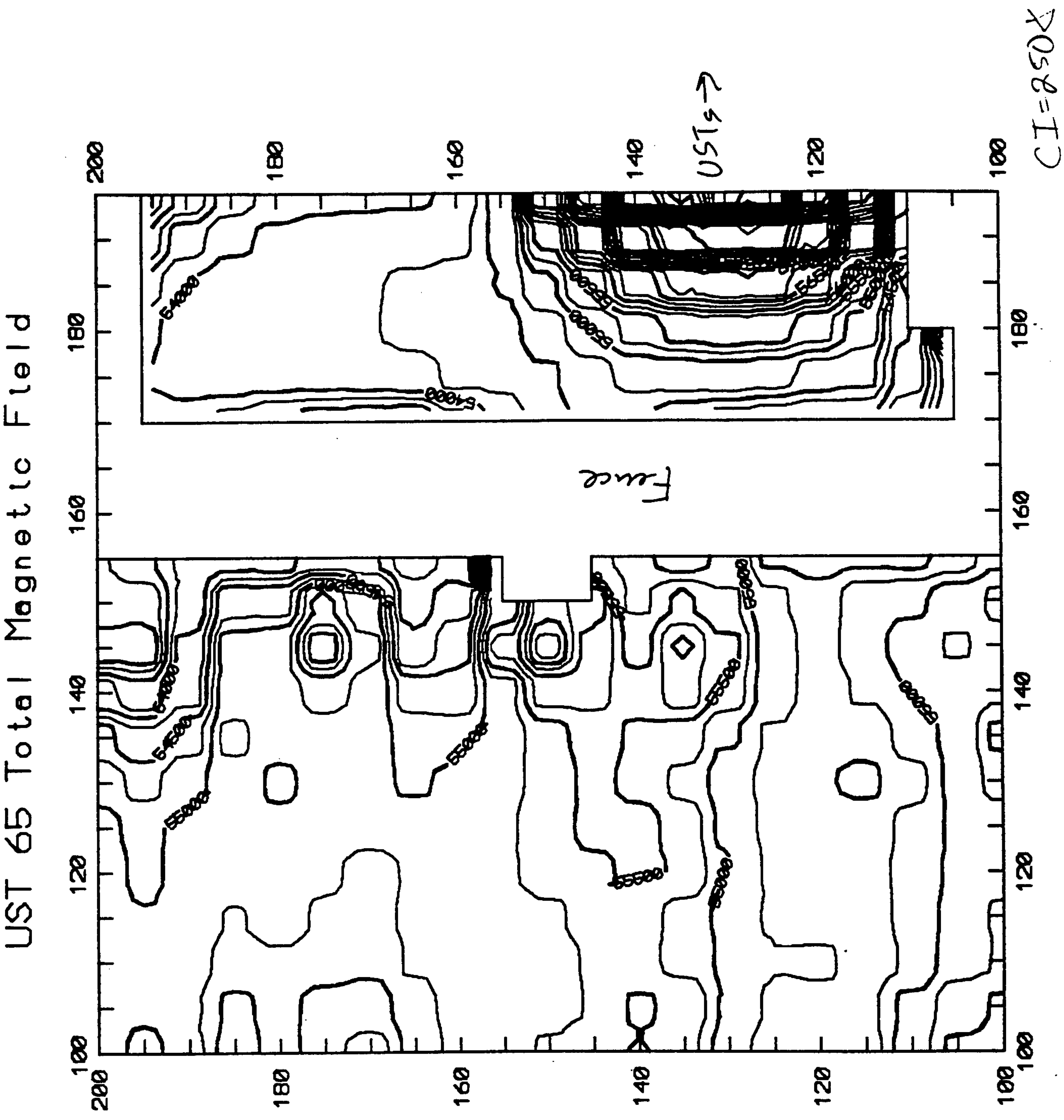
- No geophysical targets that can't be attributed to cultural interference.

DAMES & MOORE UST 65

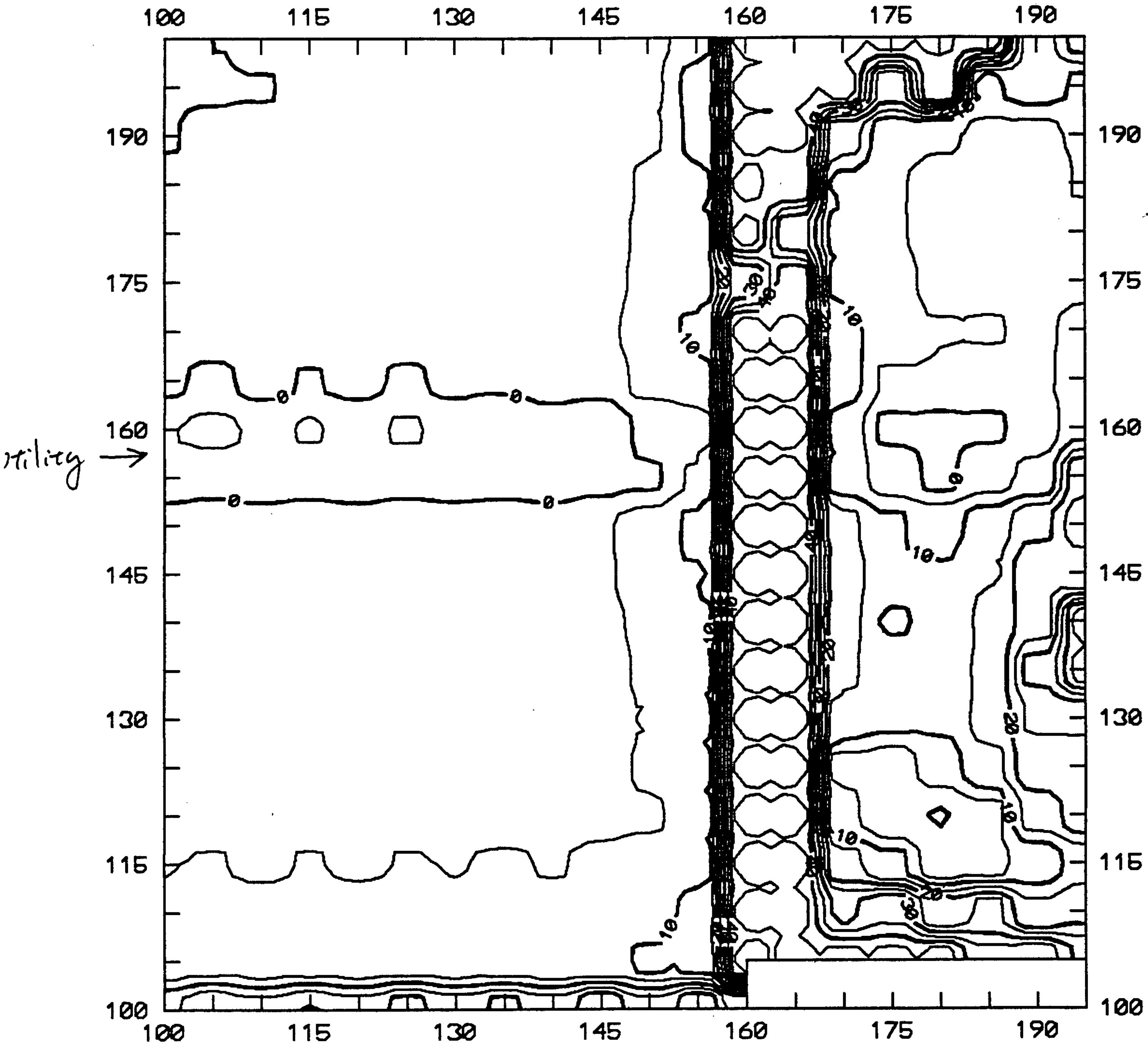
		Sheet No.	
		Calc. No.	
		Rev. No.	
Job No.	Job	By JNA	Date 7/29/92
Client	Subject	Chk'd.	Date




UST 65 Vertical Magnetic Gradient
Fence
USTs →
CI = 10
100
120
140
160
180
200

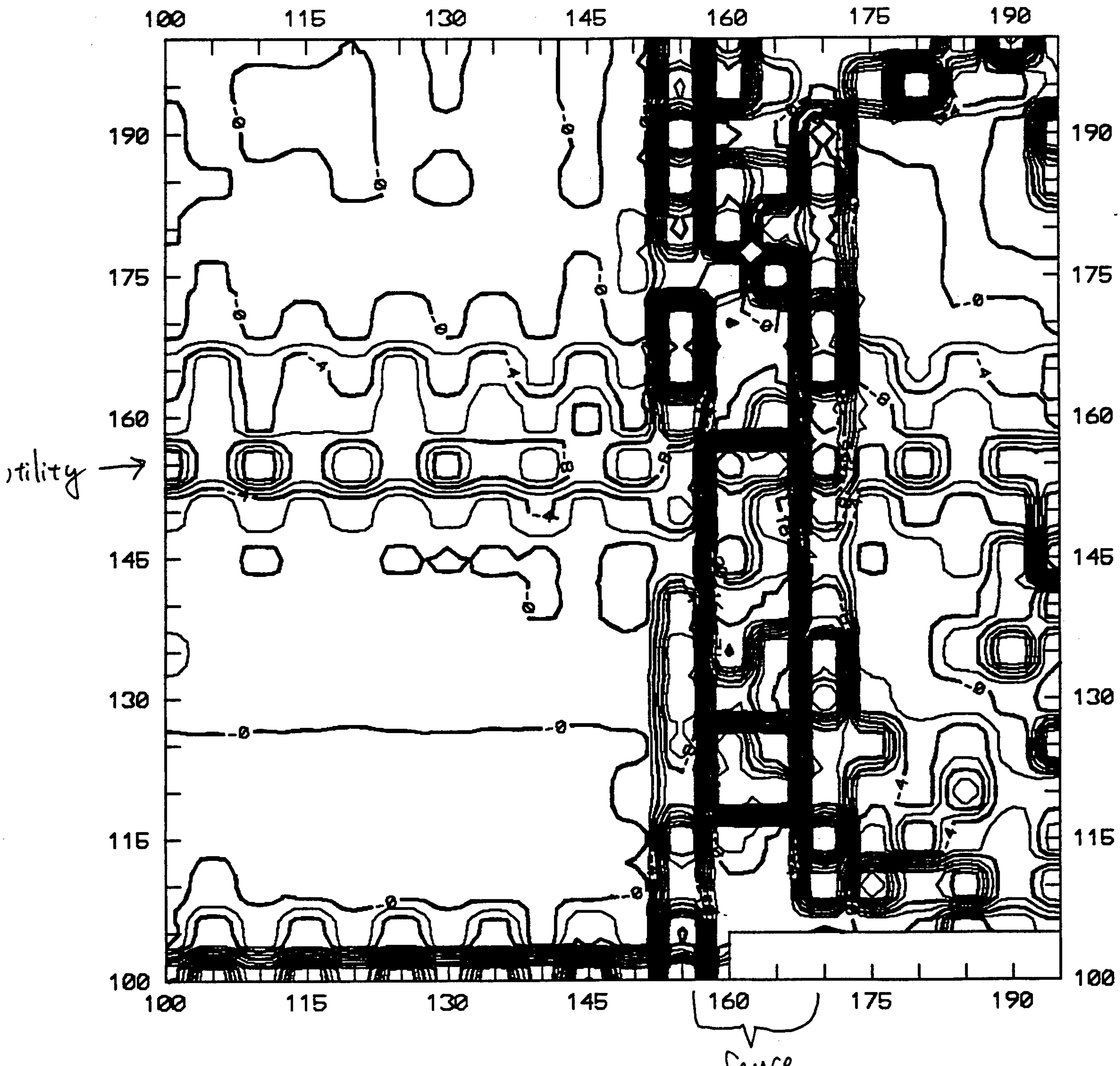

UST 65 Total Magnetic Field
Fence
USTs →
CI=250γ
100
120
140
160
180
200
54000
54500
55000

UST 65 EM N-S In-Phase Readings



CI = 5 ppt

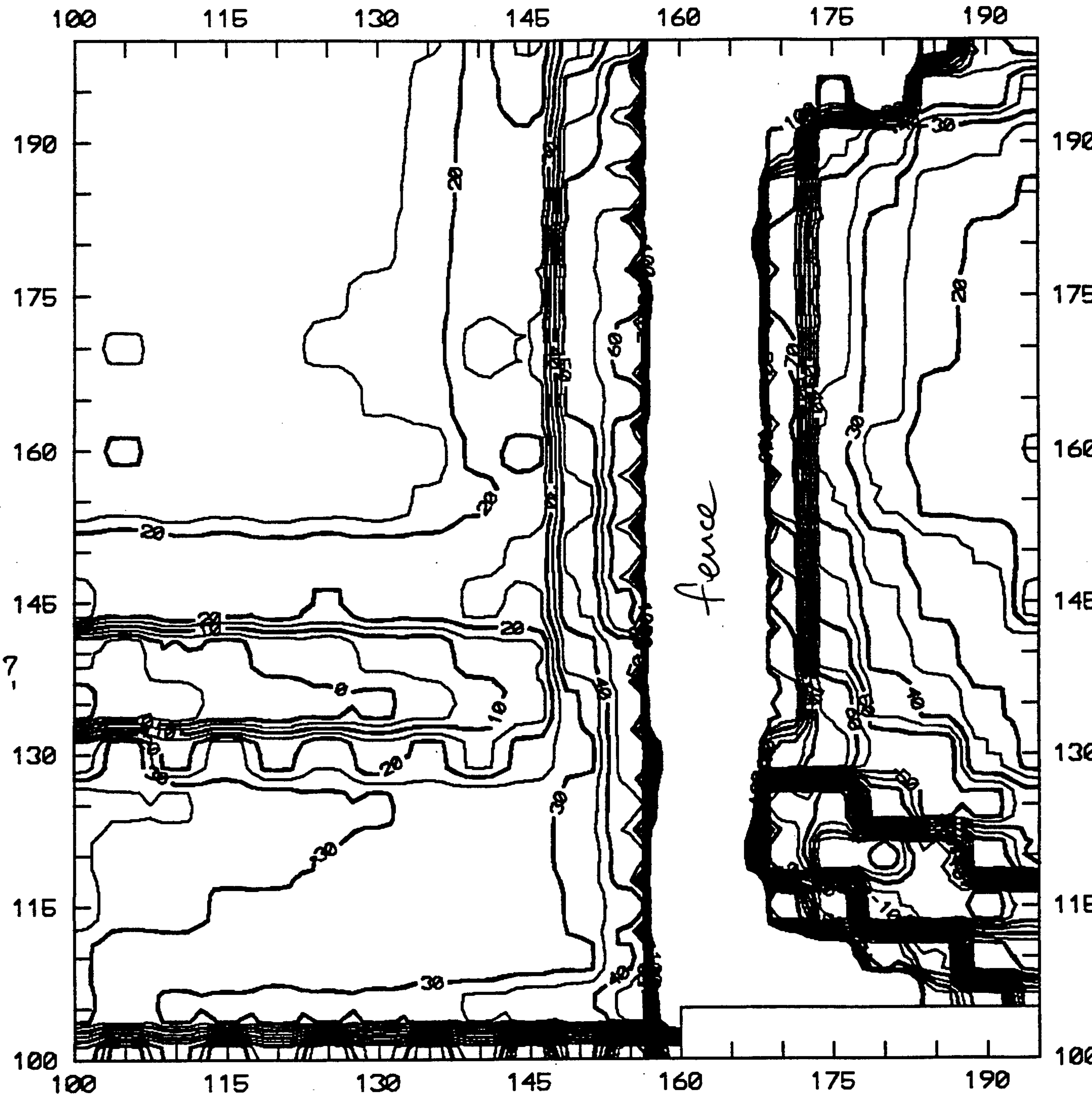
UST 65 EM In-Phase Diffference



CI = 2 ppt

UST 65 EM N-S Conductivity

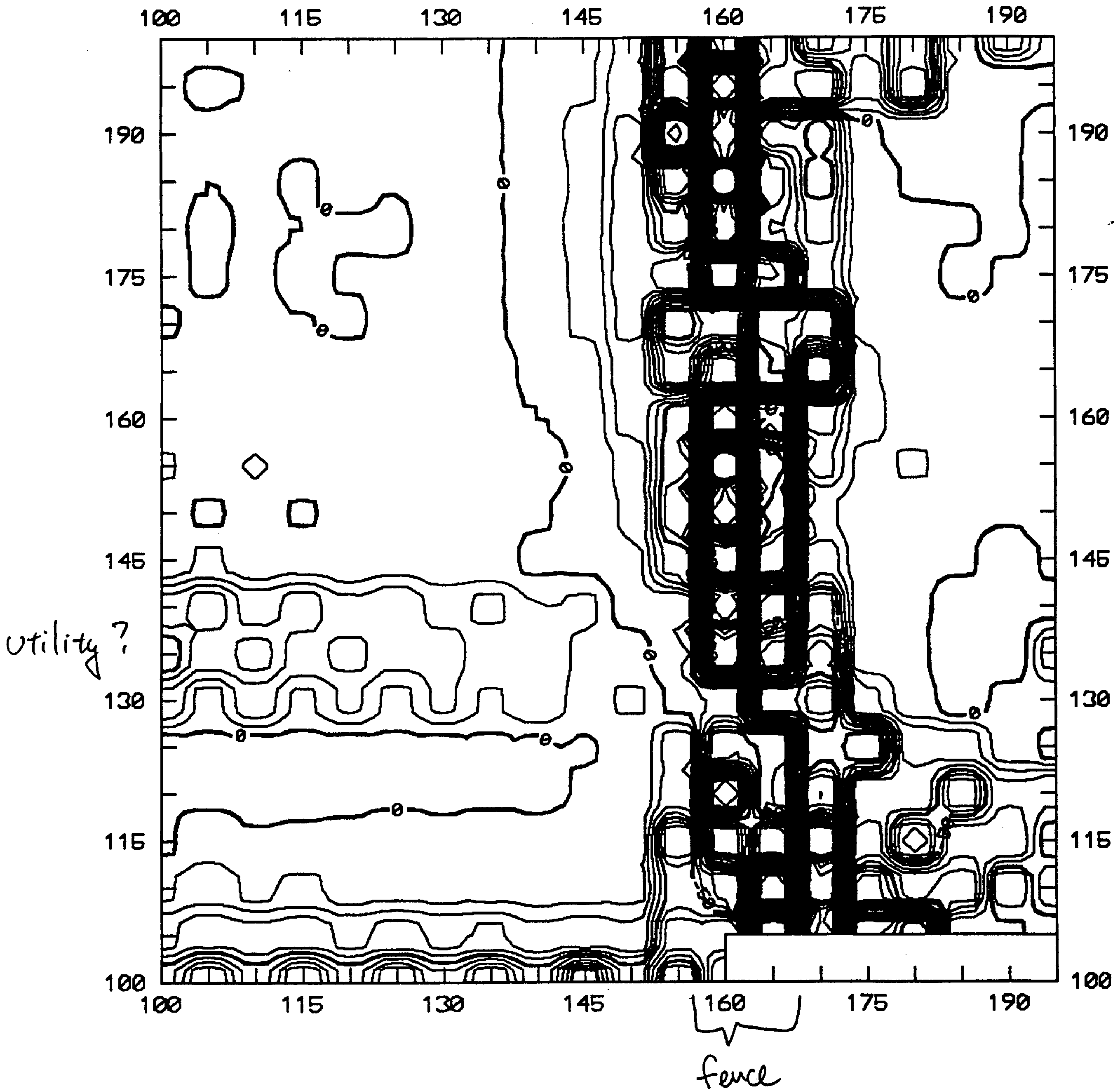
utility ?



CI = 5 mmho/m

clipped > 100 mmho/m

UST 65 EM Conductivity Difference



INTERPRETATION NOTES
USTs 76 & 77

I. SITE MAP

- 120'x200' grid, 5' spacing

- No indication of USTs based upon surficial evidence.

II. MAGNETOMETER DATA

- One small but strong anomaly appears in both magnetic data sets. The anomaly is centered N200/E285. The anomaly is located less than 5' from a 4'-tall, steel water supply pipe. Although the water supply pipe is probably the source of the anomaly, a small geophysical target may exist adjacent to the water supply pipe.

- A number of other magnetic anomalies are noted in the magnetometer data sets, however, these anomalies appear to be associated with underground utilities.

III. EM DATA

In-Phase Data

- Several small anomalies are observed in the In-Phase EM data sets. All but one of these anomalies appear to be associated with utilities. The remaining anomaly, located N195/E285, occurs less than 10' from a 4'-tall, steel water supply pipe. This location is coincidental to the magnetic anomaly discussed above. Although the water supply pipe is probably the source of the anomaly, a small geophysical target may exist adjacent to the water supply pipe.

Conductivity Data

- One small anomaly is also observed in the EM Conductivity data sets. This anomaly is located N195/E285 and is coincidental to both the In-Phase EM and magnetic anomalies discussed previously. Although the water supply pipe is probably the source of the anomaly, a small geophysical target may exist adjacent to the water supply pipe.

IV. CONCLUSIONS

- One small but strong anomaly is observed in the magnetic and EM data sets. The anomaly is centered N195/E285. Although it is probable that the anomaly results from a nearby steel water supply line, this anomaly should be considered a possible geophysical target.

UST's 76 & 77

DAMES & MOORE A PROFESSIONAL LIMITED PARTNERSHIP

Sheet No.

Calc. No.

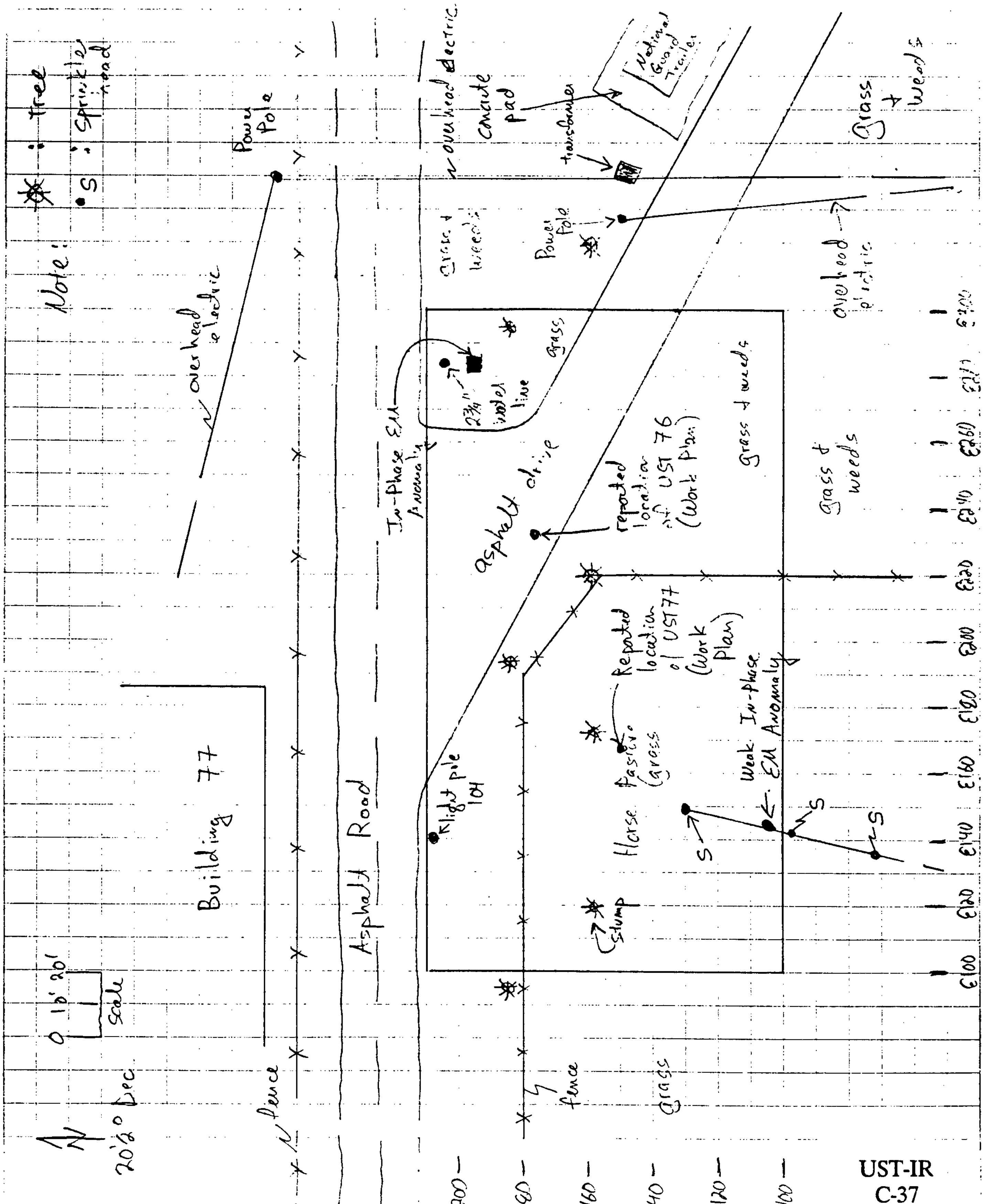
Rev. No.

Job No. Job

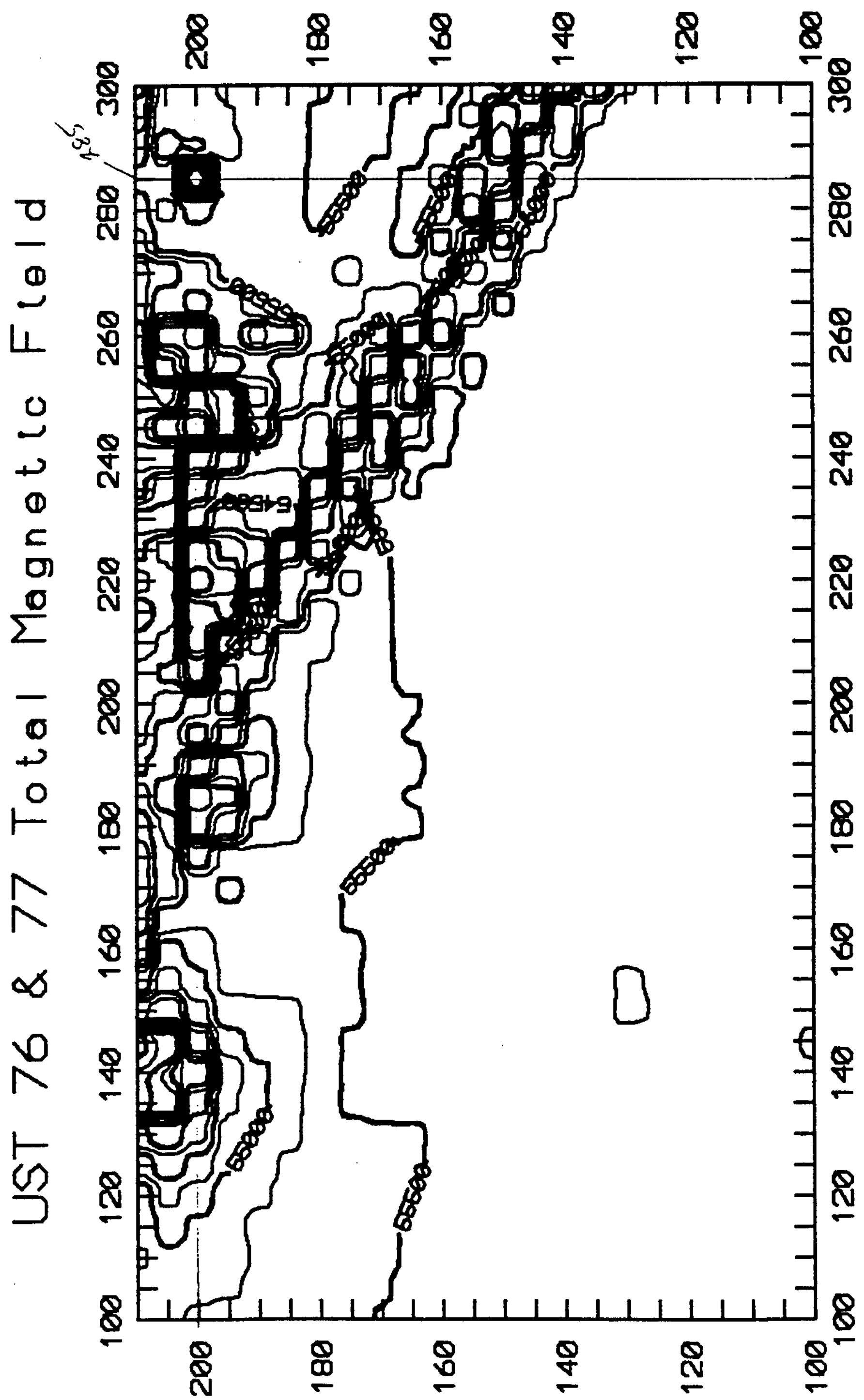
By JMA Date 9/14/92

Client Subject

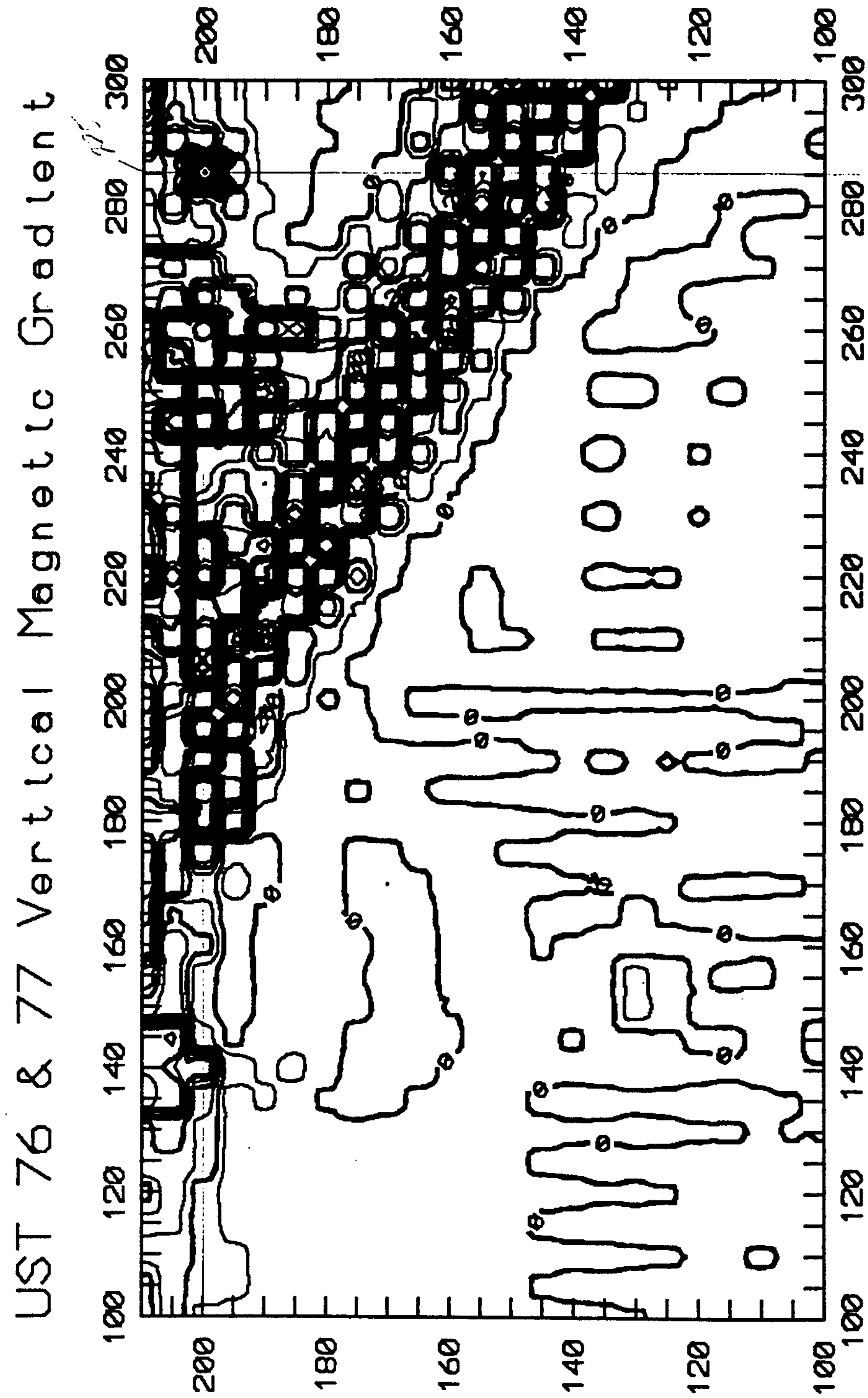
Chk'd. Date



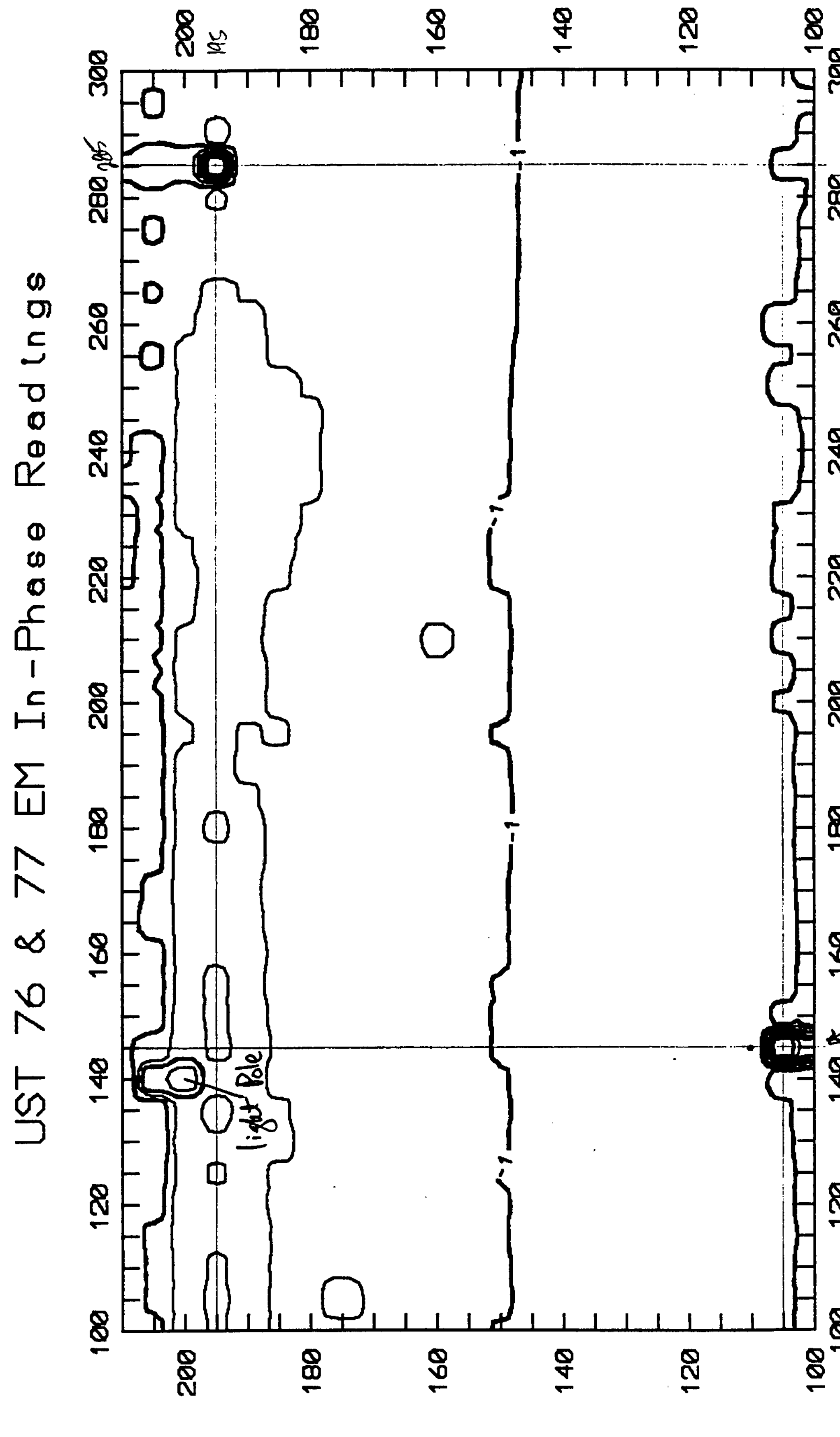
UST-IR
C-37

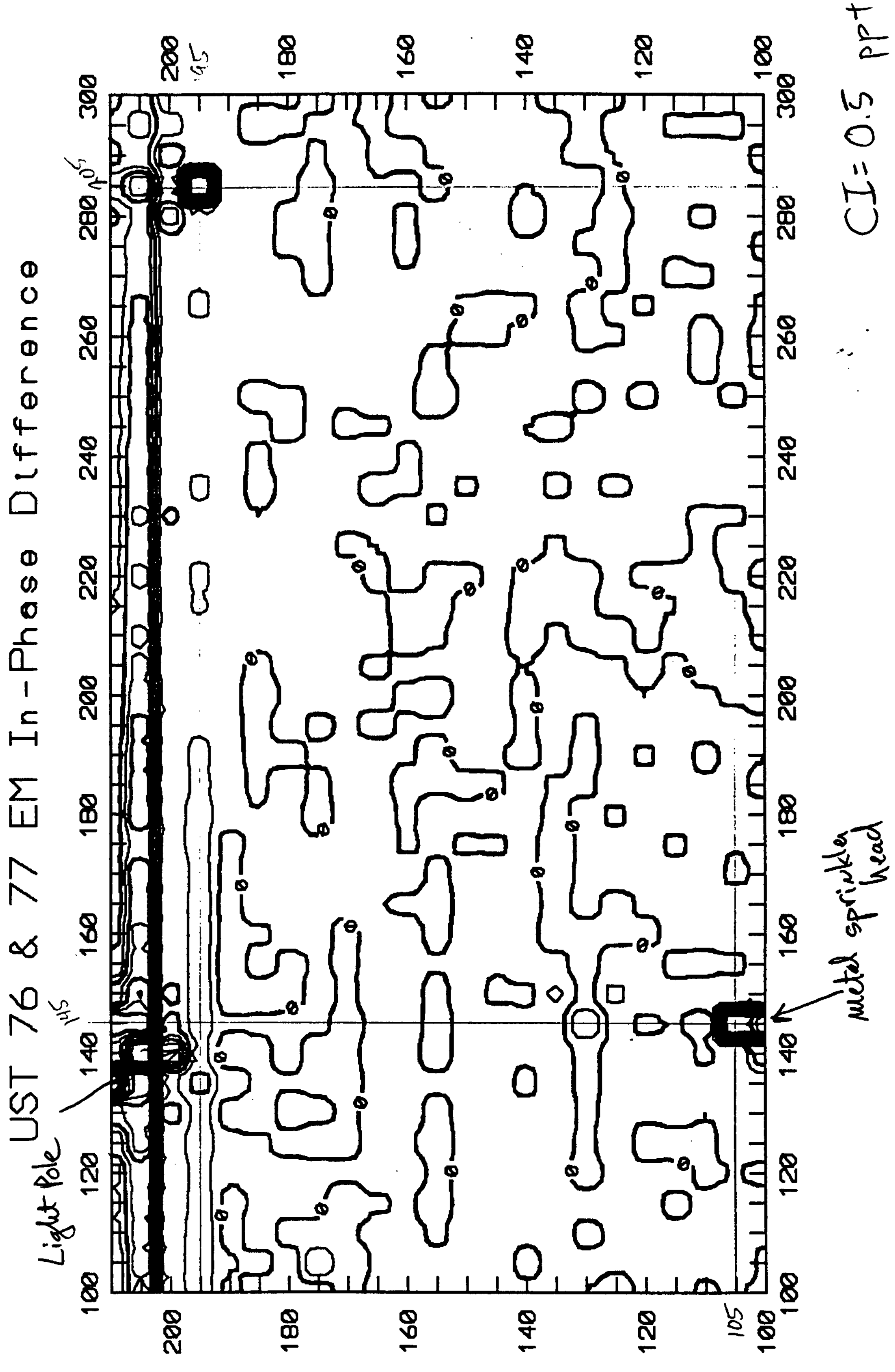

UST 76 & 77 Total Magnetic Field
100
120
140
160
180
200
220
240
260
280
300
55500

CI = 100γ

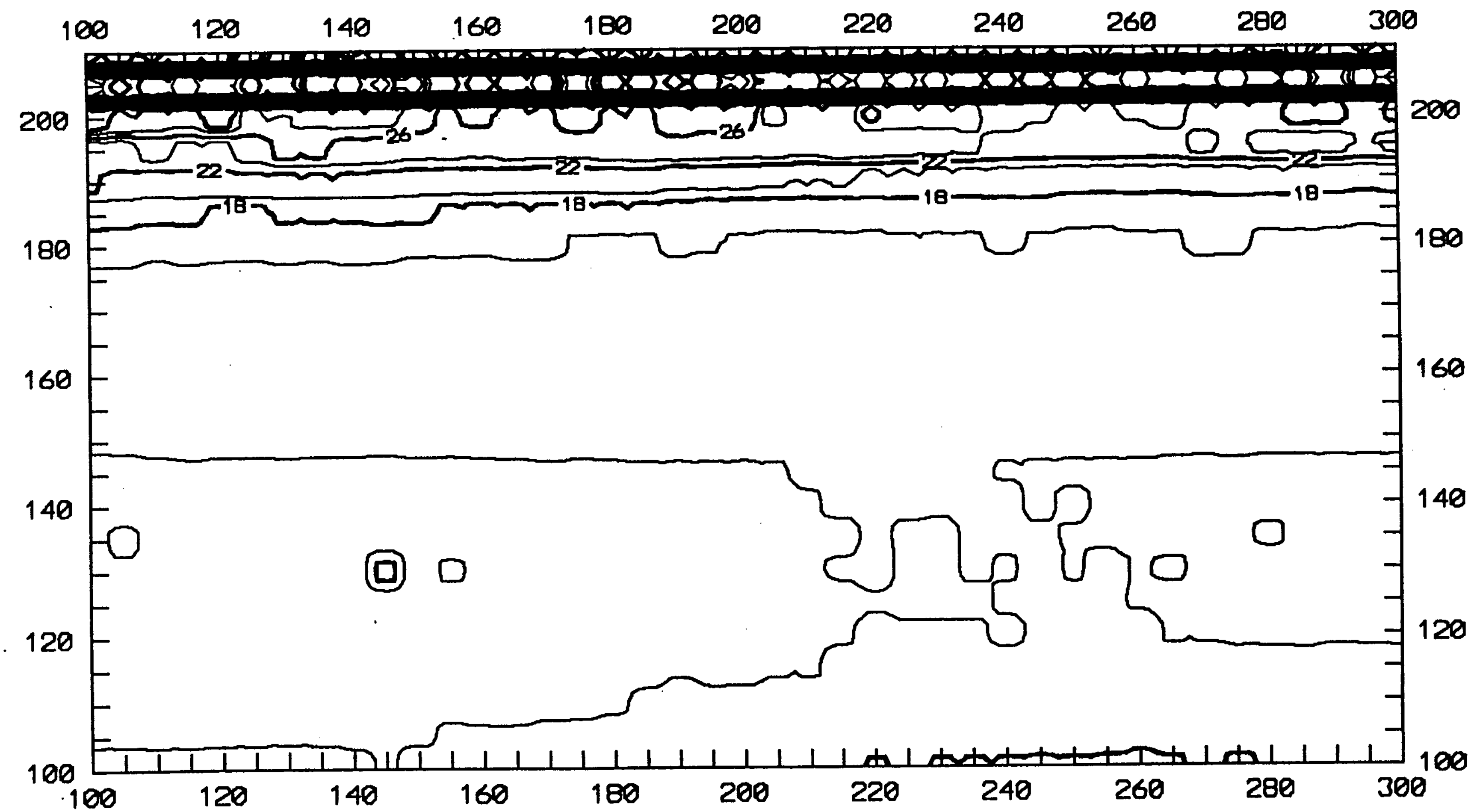

UST 76 & 77 Vertical Magnetic Gradient
100
120
140
160
180
200
220
240
260
280
300
100
120
140
160
180
200

CI 1 ppt

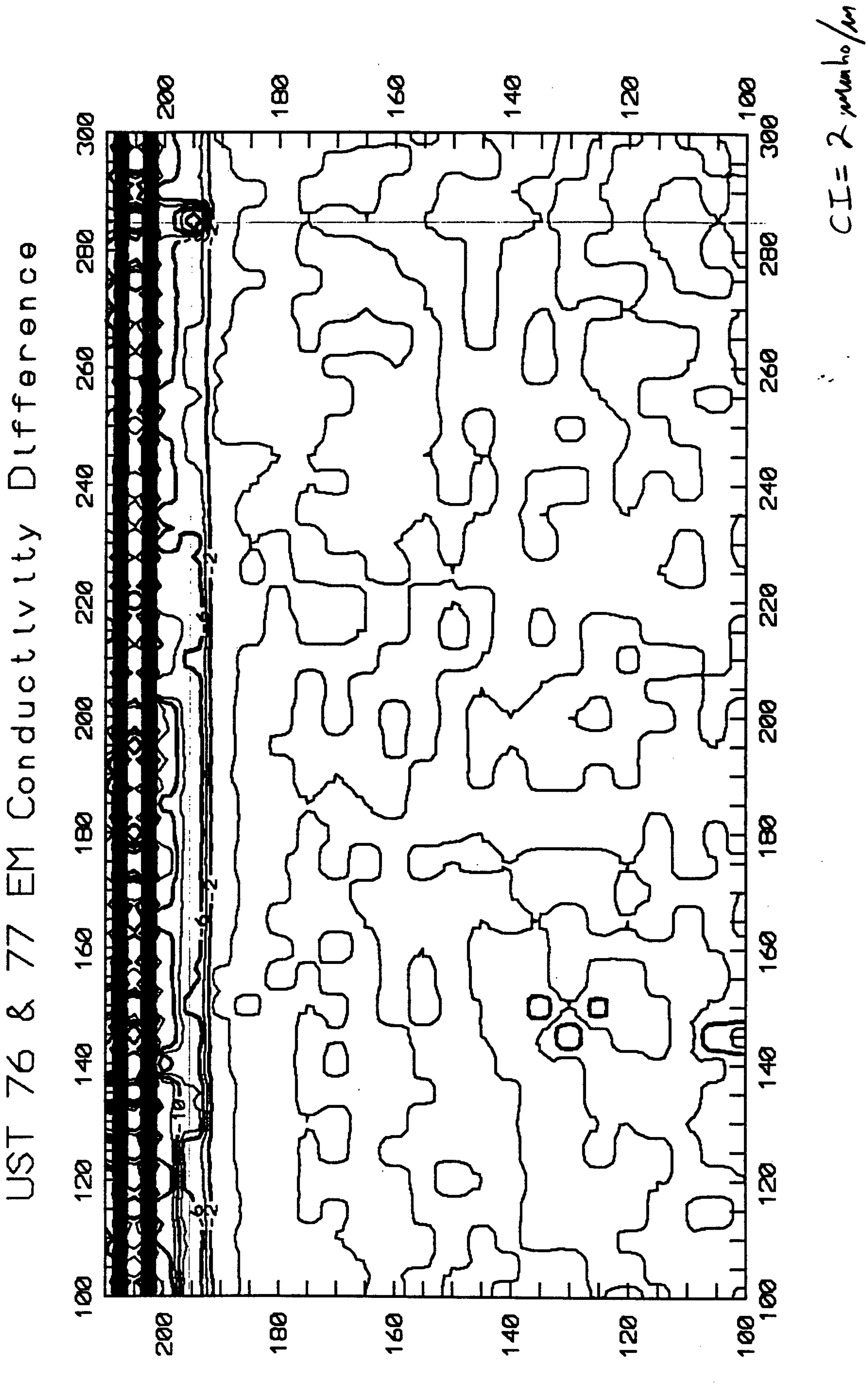



UST 76 & 77 EM In-Phase Difference
CI = 0.5 ppt
Light Pole
metal sprinkler head
100
120
140
160
180
200
220
240
260
280
300

UST 76 & 77 EM N-S Conductivity



2 mmho/m


UST 76 & 77 EM Conductivity Difference
100
120
140
160
180
200
220
240
260
280
300
CI = 2 μmho/m

INTERPRETATION NOTES
UST 79

I. SITE MAP

- 45'x100' grid, 5' spacing
- Little indication of USTs based upon surficial evidence.
  - Patch in concrete apron in the reported vicinity of the UST (Work Plan).
- The site contained a good deal of cultural interference due to underground utilities and the proximity of the building.

II. MAGNETOMETER DATA

- Several anomalies are observed in the magnetometer data sets. All but one of these anomalies appear to result from cultural interference (utilities, building, etc.) The remaining anomaly is observed in the vertical gradient data, and is located N110/E155. Although it is possible that this anomaly results from interference due to nearby Building 54, a geophysical targets appears to be located in the vicinity of N110/E155.

III. EM DATA

In-Phase Data

- Several small anomalies are observed in the In-Phase EM data sets. All but one of these anomalies appear to be associated with utilities or the building. The remaining anomaly, located N110-115/E155, occurs in the vicinity of the reported UST (Work Plan), and is nearly coincidental to the magnetic vertical gradient anomaly discussed above. The anomaly is better defined by the In-Phase Difference map rather than the N-S In-Phase Readings map.

  Although it is possible that this anomaly results from interference due to nearby Building 54, a geophysical targets appears to be located in the vicinity of N110-115/E155.

Conductivity Data

- Several anomalies are observed in the EM Conductivity data sets. All but one of these anomalies appear to be associated with utilities or the building. The remaining anomaly, located N105/E155, occurs in the vicinity of the reported UST (Work Plan), and is nearby both the In-Phase EM anomaly and the magnetic vertical gradient anomaly discussed above.

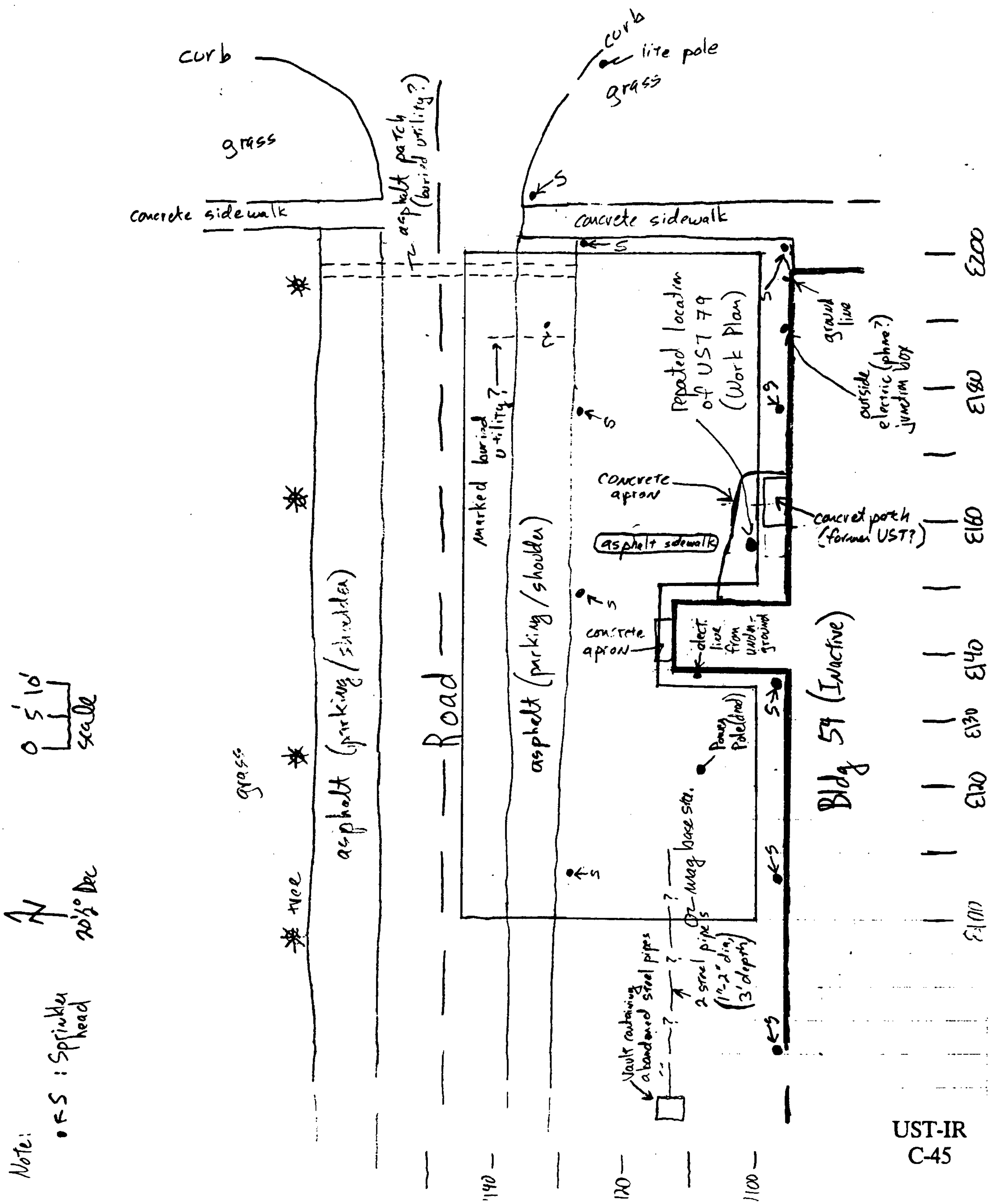
  Although it is possible that this anomaly results from interference due to nearby Building 54, a geophysical targets appears to be located in the vicinity of N105/E155.

IV. CONCLUSIONS

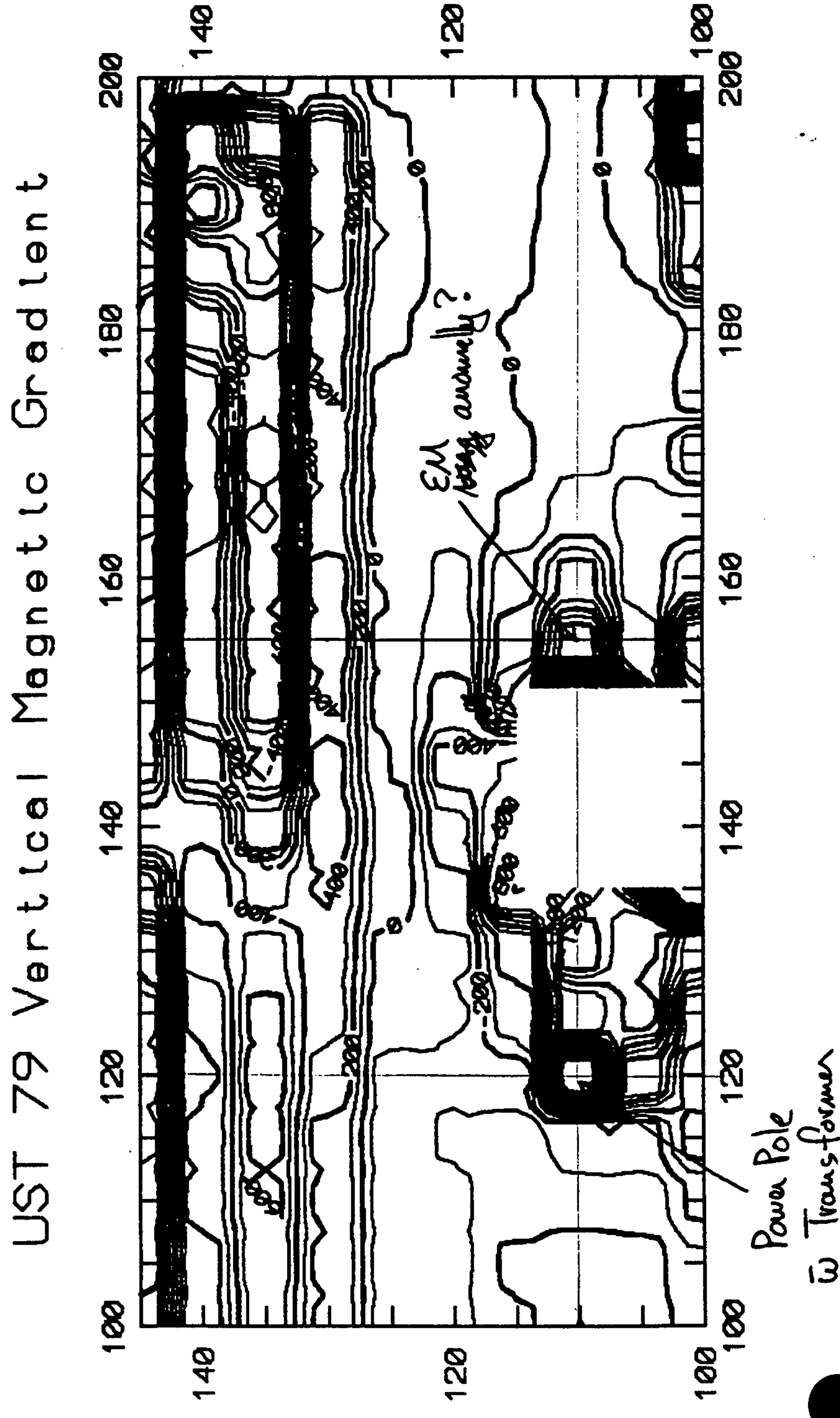
- One anomaly was observed in the magnetic and EM data sets. This anomaly is located N105-110/E155. Although it is possible that this anomaly results from interference from the nearby building, this anomaly should be considered a possible geophysical target.

DAMES & MOORE UST 79

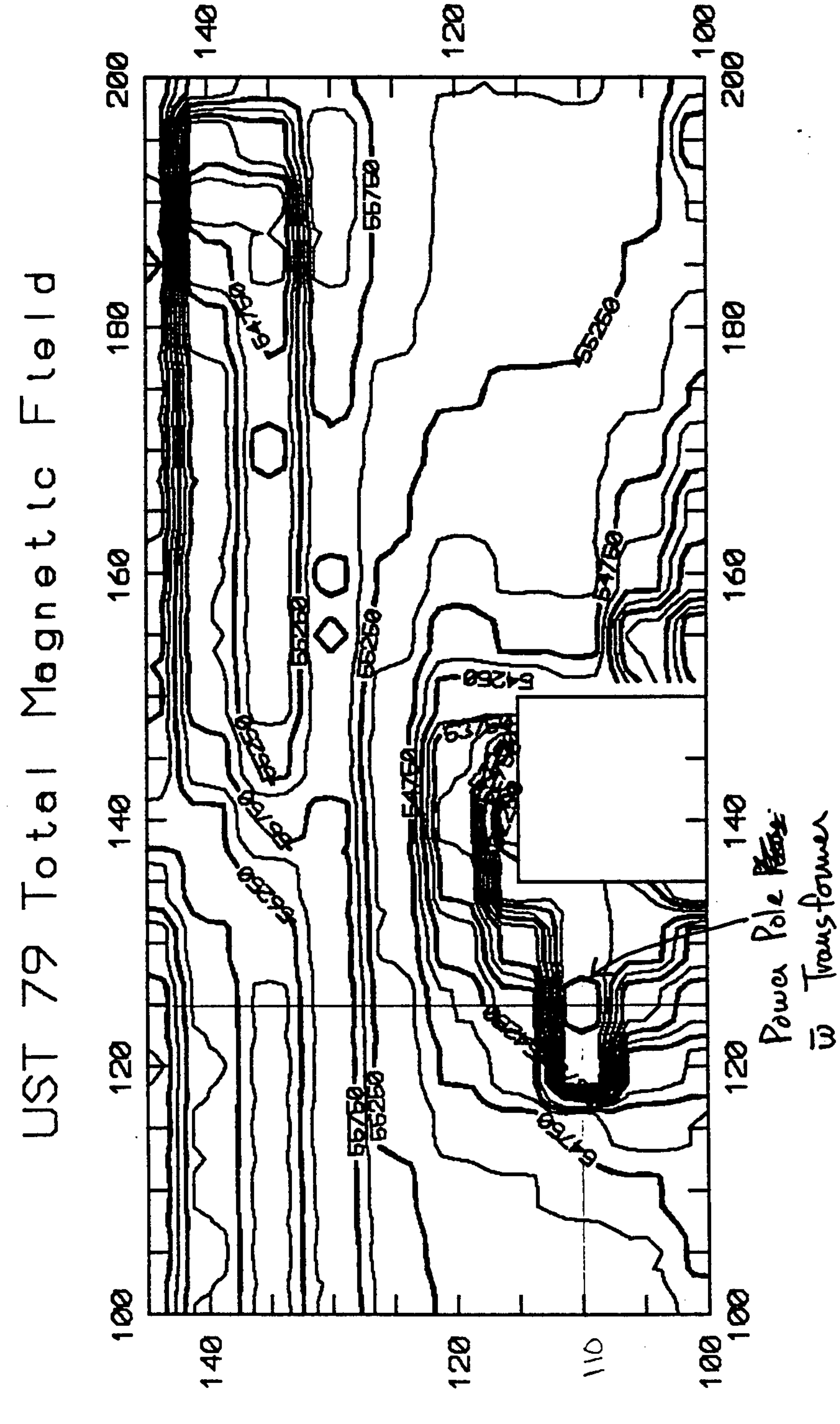
		Sheet No.	
		Calc. No.	
		Rev. No.	
Job No.	Job	By	Date 9/19/92
Client	Subject	Chk'd.	Date



CI = 100 λ

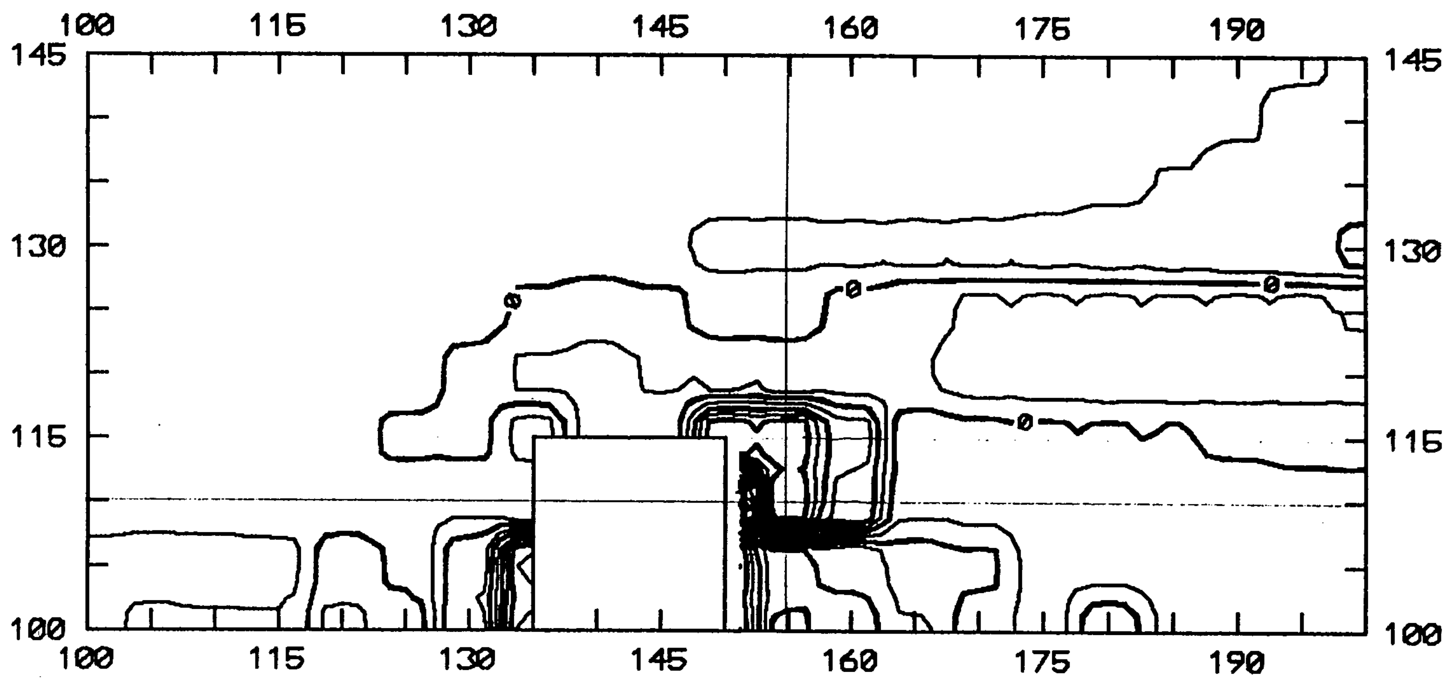

UST 79 Vertical Magnetic Gradient
100
120
140
160
180
200
100
120
140
EM anomaly?
Power Pole
w̄ Transformer

CT-2502

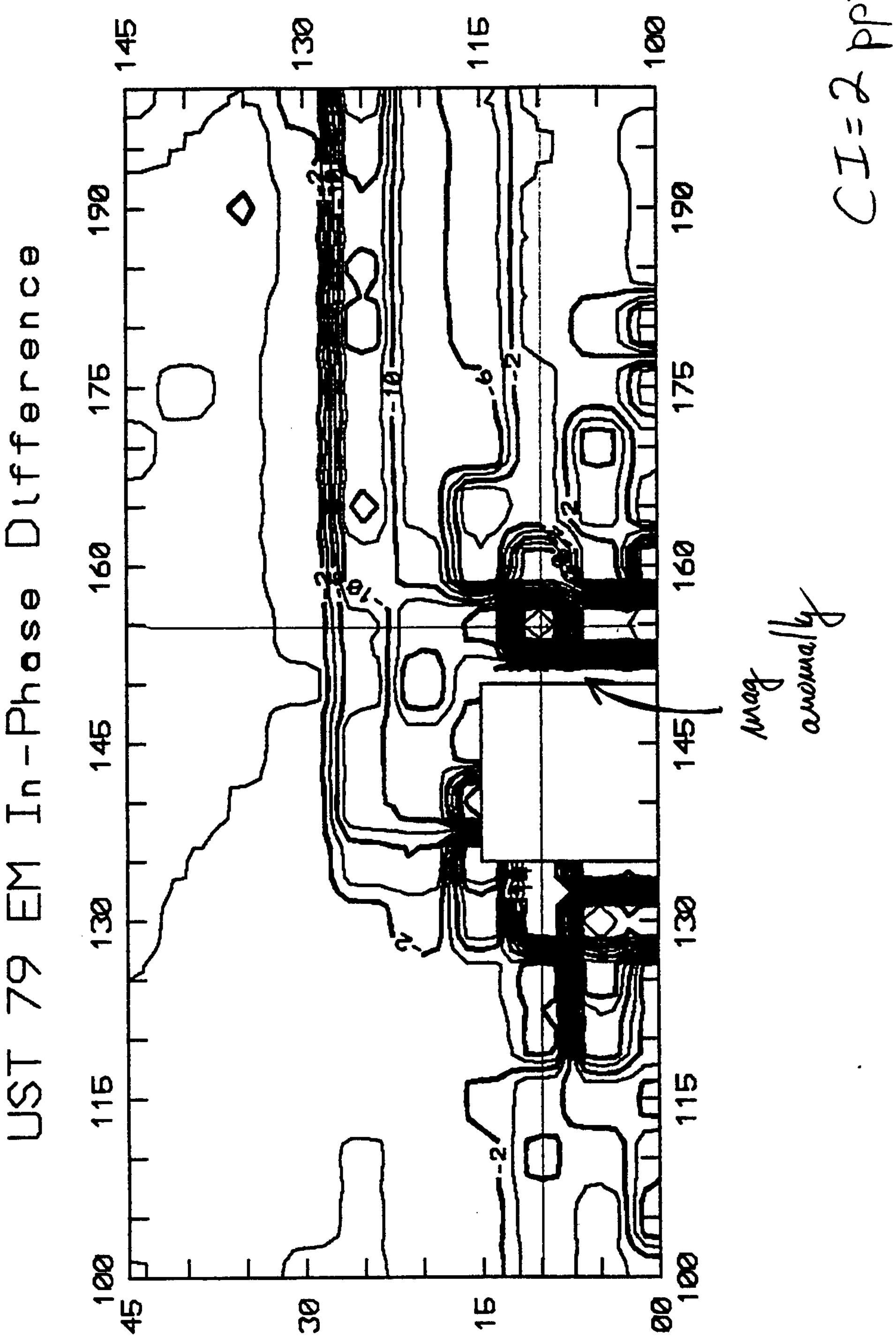


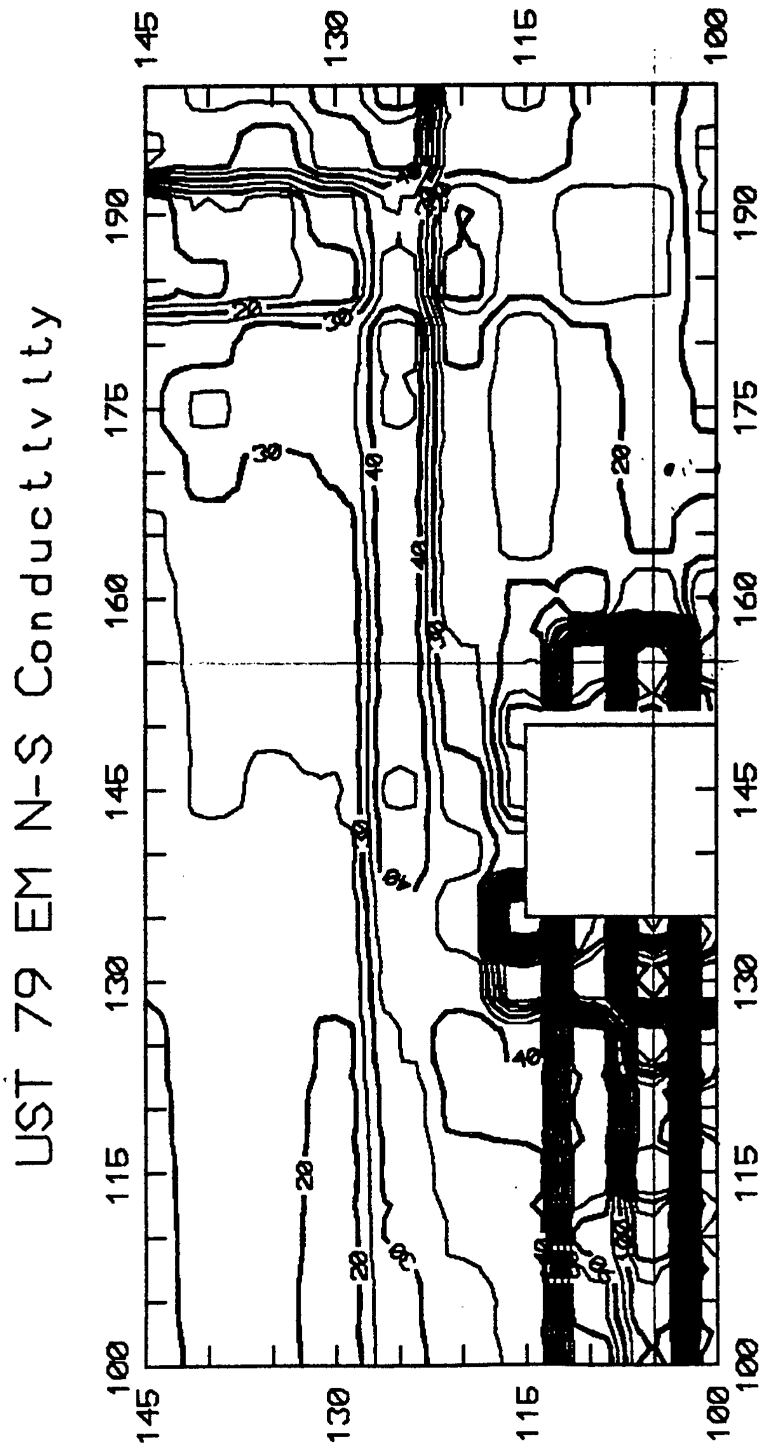
UST 79 Total Magnetic Field
100
120
140
160
180
200
110
55750
55250
54750
54250
53750
Power Pole
w̄ Transformer

UST 79 EM N-S In-Phase Readings

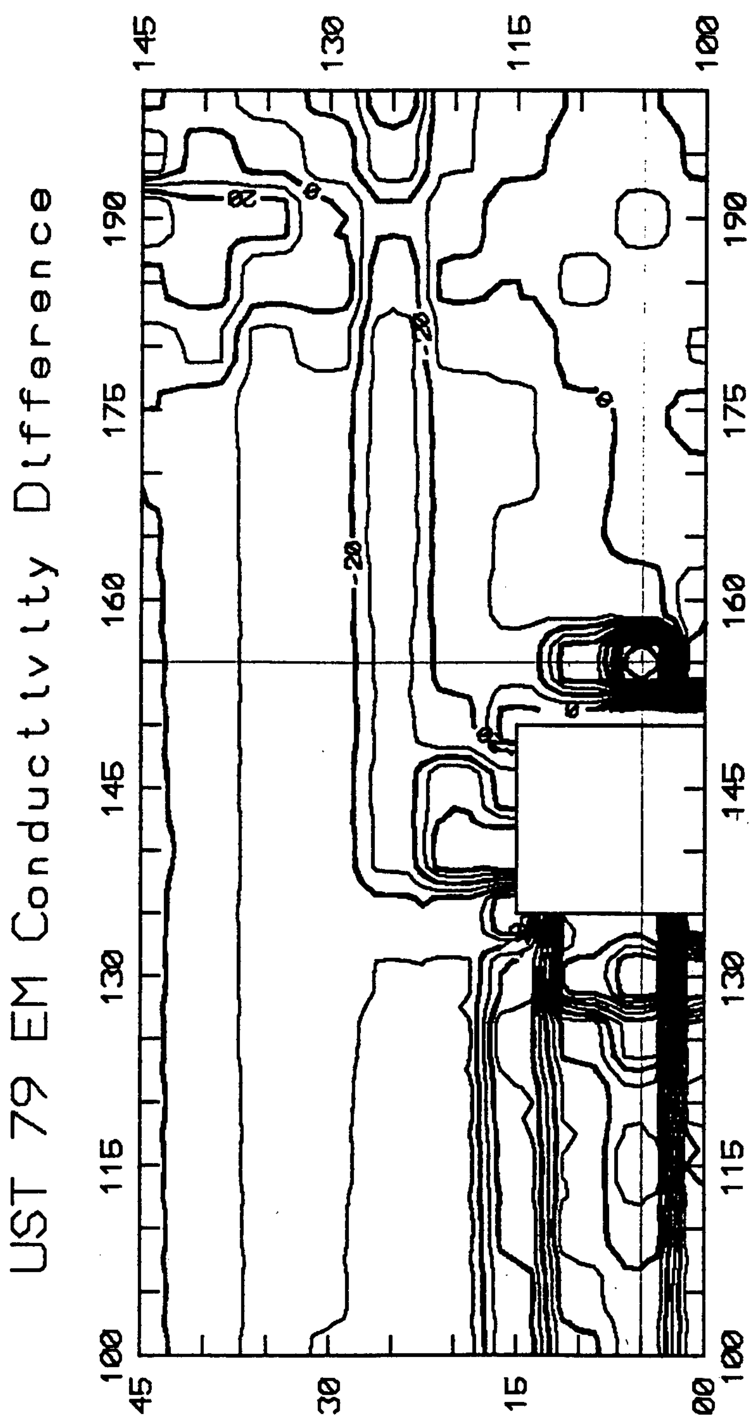


CI = 5 ppt


UST 79 EM In-Phase Difference
CI = 2 ppt
mag anomally



CI = 5 mmho/m


UST 79 EM Conductivity Difference
100
115
130
145
160
175
190
100
115
130
145
-20
0

CI = 10 mmho/m

INTERPRETATION NOTES
UST 80

I. SITE MAP
- 60'x100' grid, 5' spacing
- No indication of USTs based upon surficial evidence.
- The site contained a good deal of cultural interference from both utilities and a building. An ground-level, electrical transformer was observed to occur in the vicinity of the reported UST (Work Plan).

II. MAGNETOMETER DATA
- Several anomalies are observed in the magnetic data sets. All but one of these anomalies appear to result from cultural interference (utilities, building, etc.) The remaining anomaly is observed in both the vertical gradient and total field data, and is located N105/E160. Although it is possible that this anomaly results from interference due to nearby utilities, a geophysical targets appears to be located in the vicinity of N105/E160.

III. EM DATA

In-Phase Data
- Several anomalies are observed in the In-Phase EM data sets. Most of these anomalies appear to be associated with either the building, utilities, or varioations in the soils. One anomaly, located N105-110/E160, occurs in the vicinity of the reported UST (Work Plan), and is nearly coincidental to the magnetic anomaly discussed above. The anomaly is better defined by the In-Phase Difference map rather than the N-S In-Phase Readings map.
  Although it is possible that this anomaly results from interference due to nearby Building 53 or utilities, a geophysical targets appears to be located in the vicinity of N105-110/E160.
- Some of the larger patterns of elevated values, such as the area from N120-125/E165-200, may be attributed to incomplete decoupling of the in-phase and conductivity components.

Conductivity Data
- Several anomalies are also observed in the EM Conductivity data sets. Most of these anomalies appear to be associated with either the building, utilities, or variations in the soils. One anomaly, located N105/E160, occurs in the vicinity of the reported UST (Work Plan), and is nearby both the In-Phase EM anomaly and the vertical magnetic gradient anomaly discussed above. The EM Conductivity anomaly appears to be masked by cultural interference.
  Although it is possible that this anomaly results from interference due to nearby Building 53, a geophysical targets appears to be located in the vicinity of N105/E160.
- Additional processing of the EM Conductivity data may allow an enhanced interpretation.

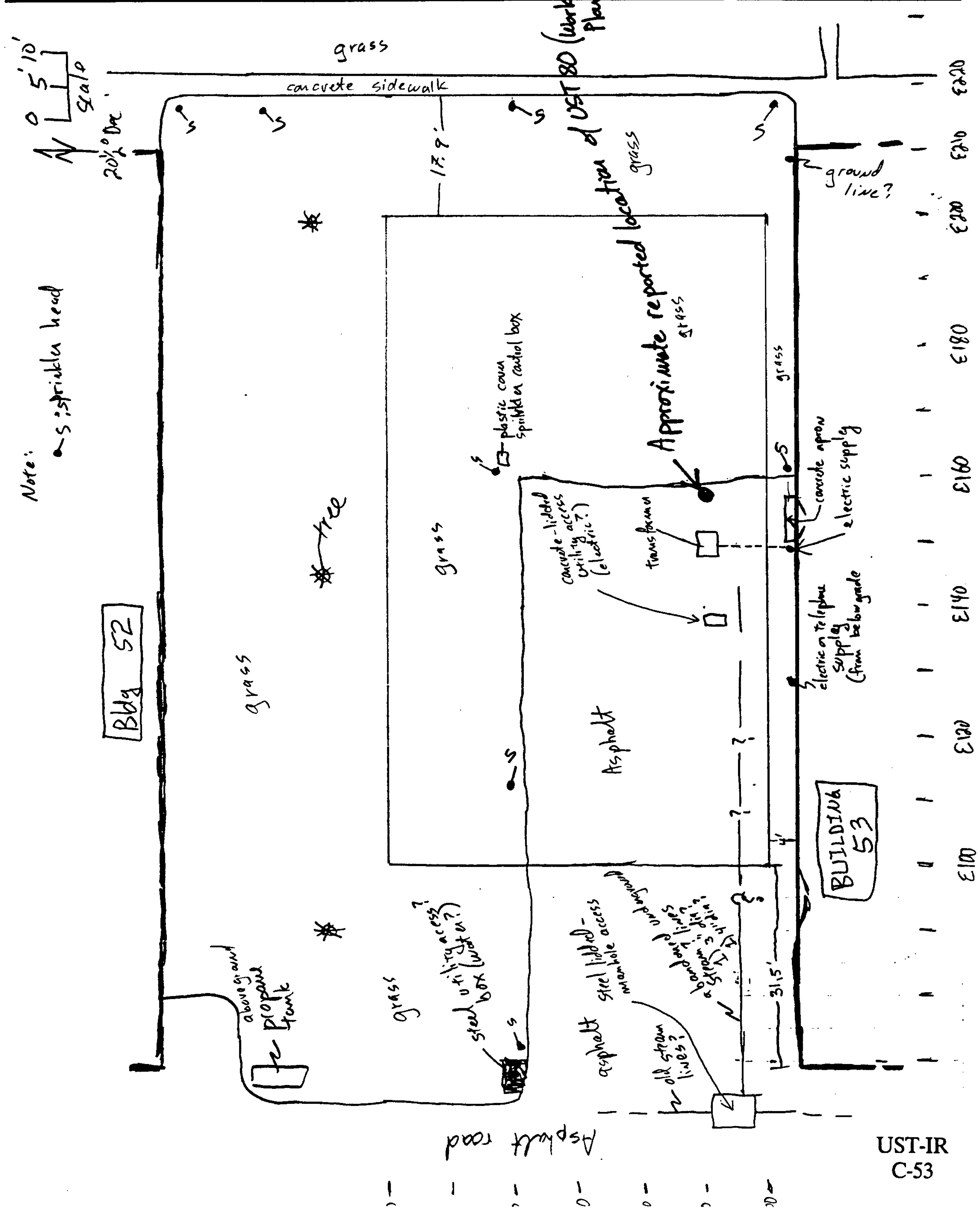
IV. CONCLUSIONS
- One anomaly was observed in the magnetic and EM data sets. This anomnaly is located N105-110/E160. Although the anomaly is partially masked by cultural interference, this anomaly should be considered a possible geophysical target.

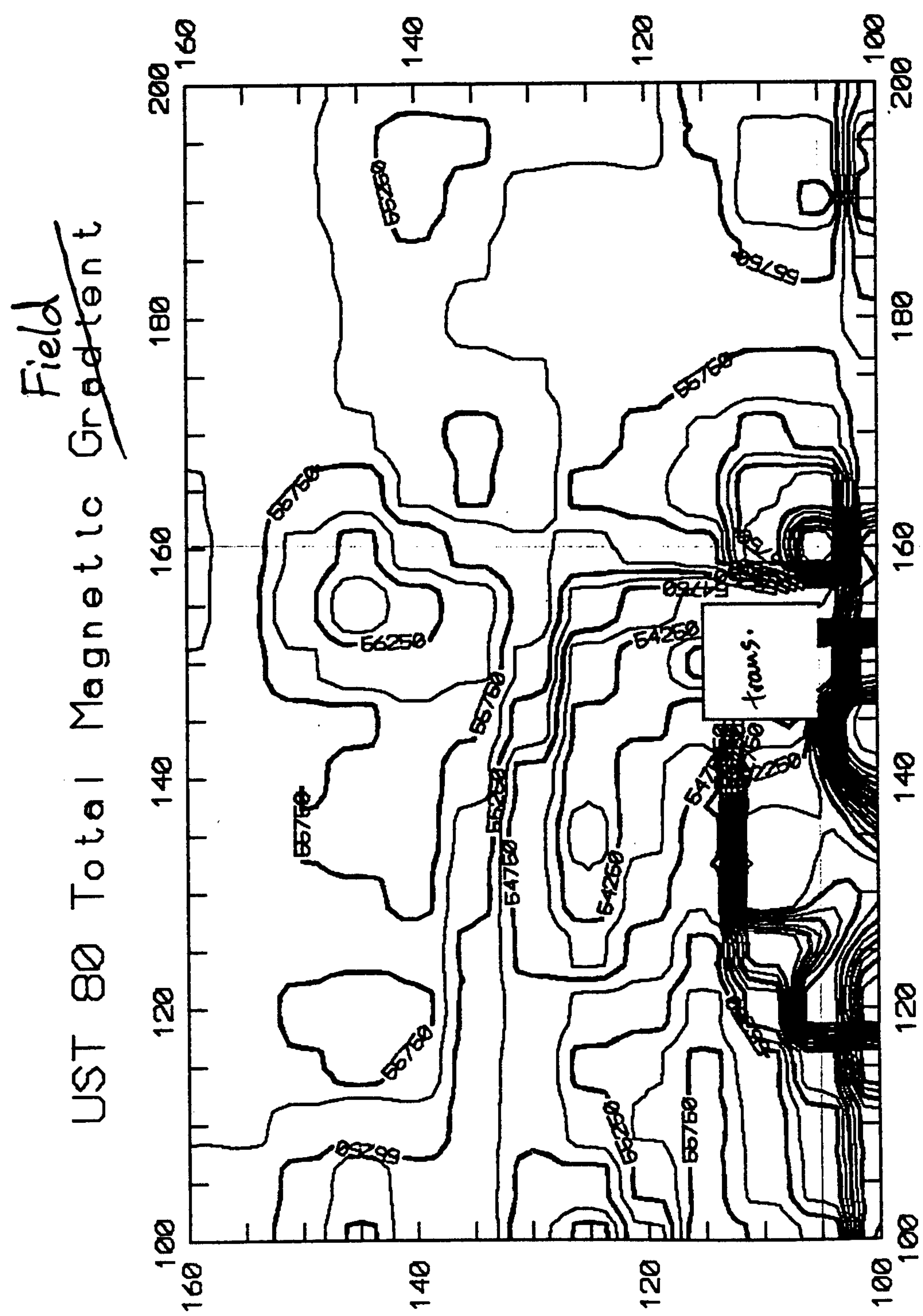
DAMES & MOORE

UST 80

Sheet No.
Calc. No.
Rev. No.

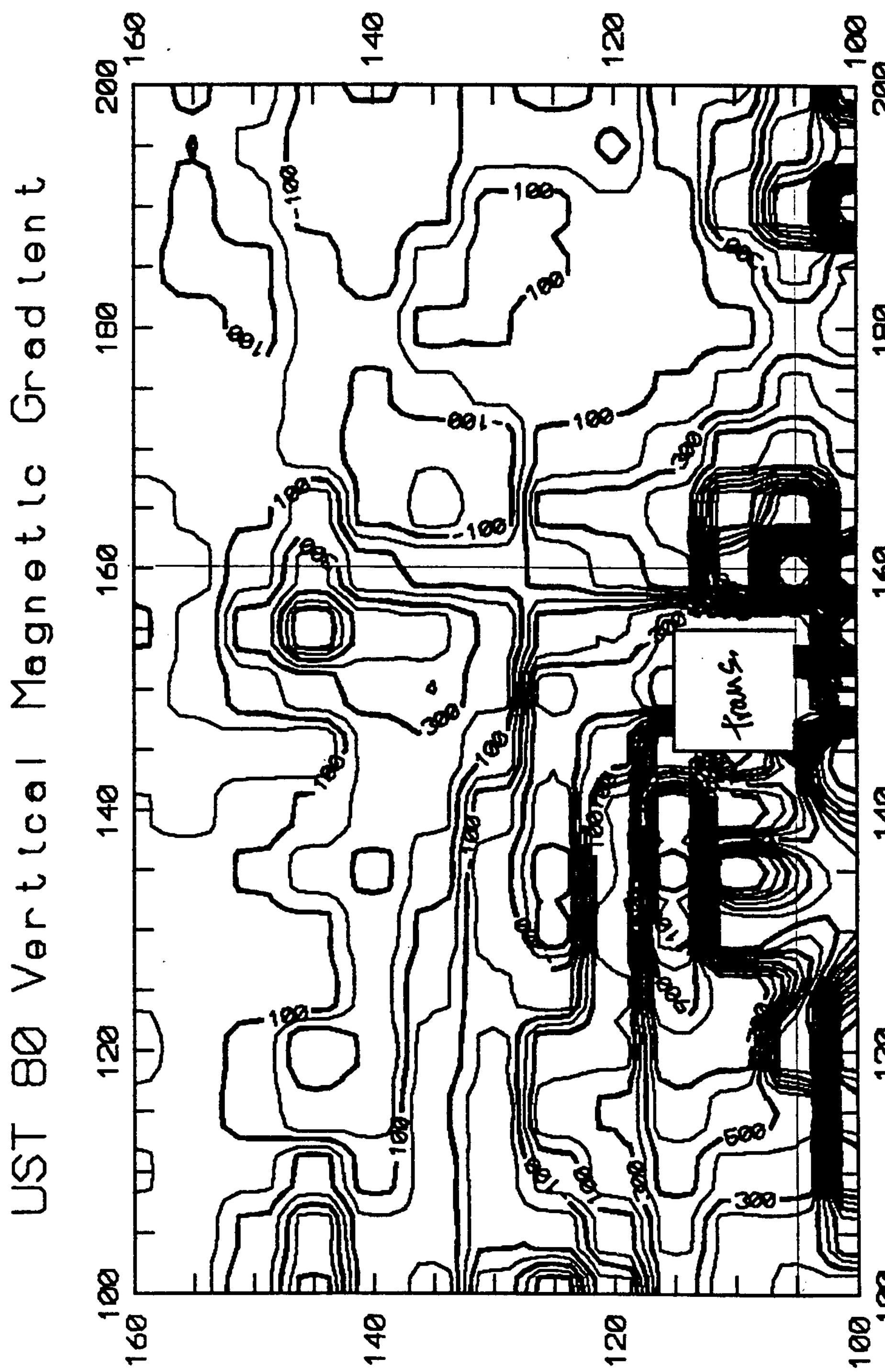
Job No.	Job	By JMA Date 9/23
Client	Subject	Chk'd. Date



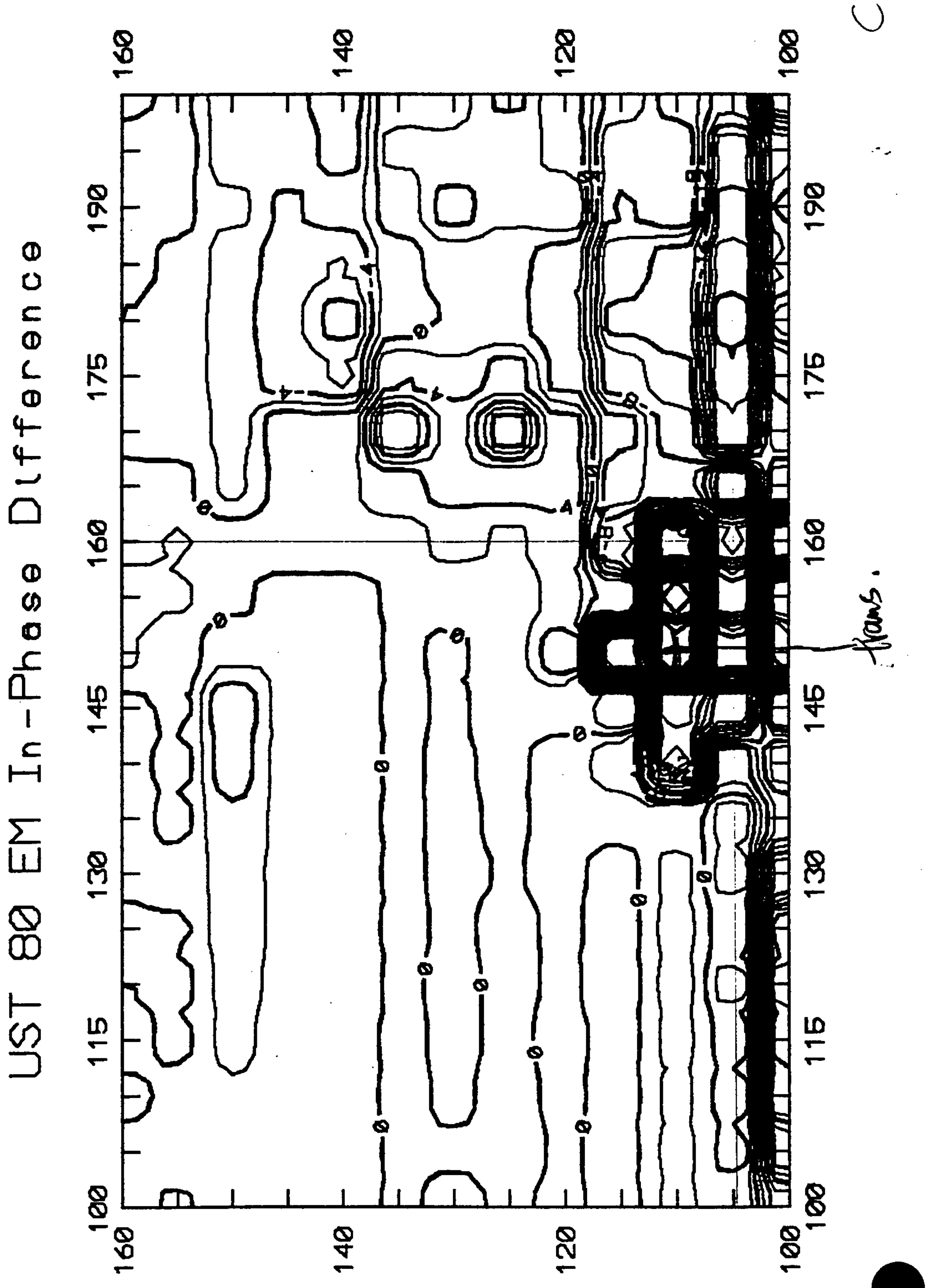

UST 80 Total Magnetic ~~Gradient~~ Field
trans.
56250
56750
55750
55250
54750
54250
100
120
140
160
180
200

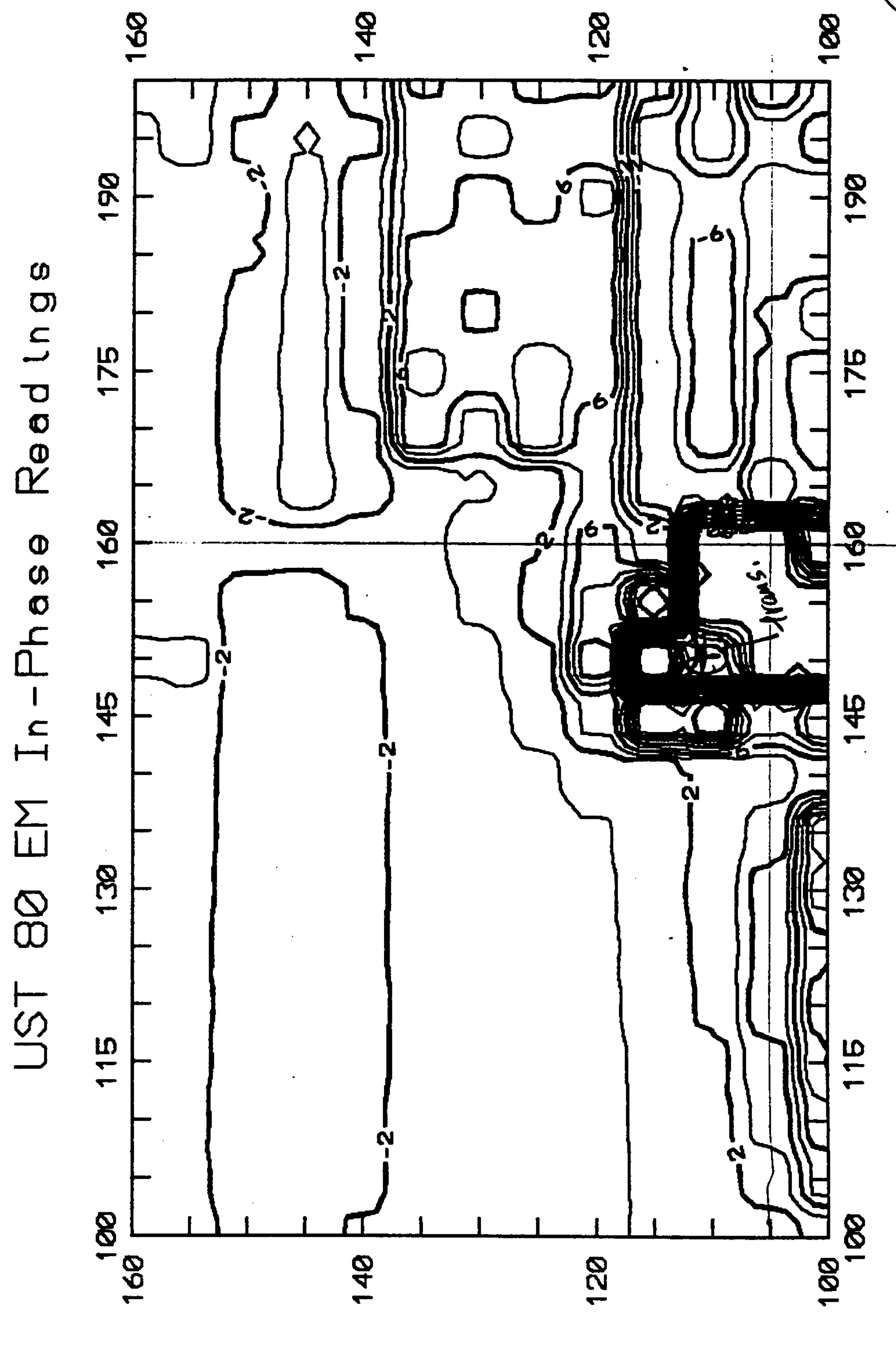
CI=250

CI = 100γ



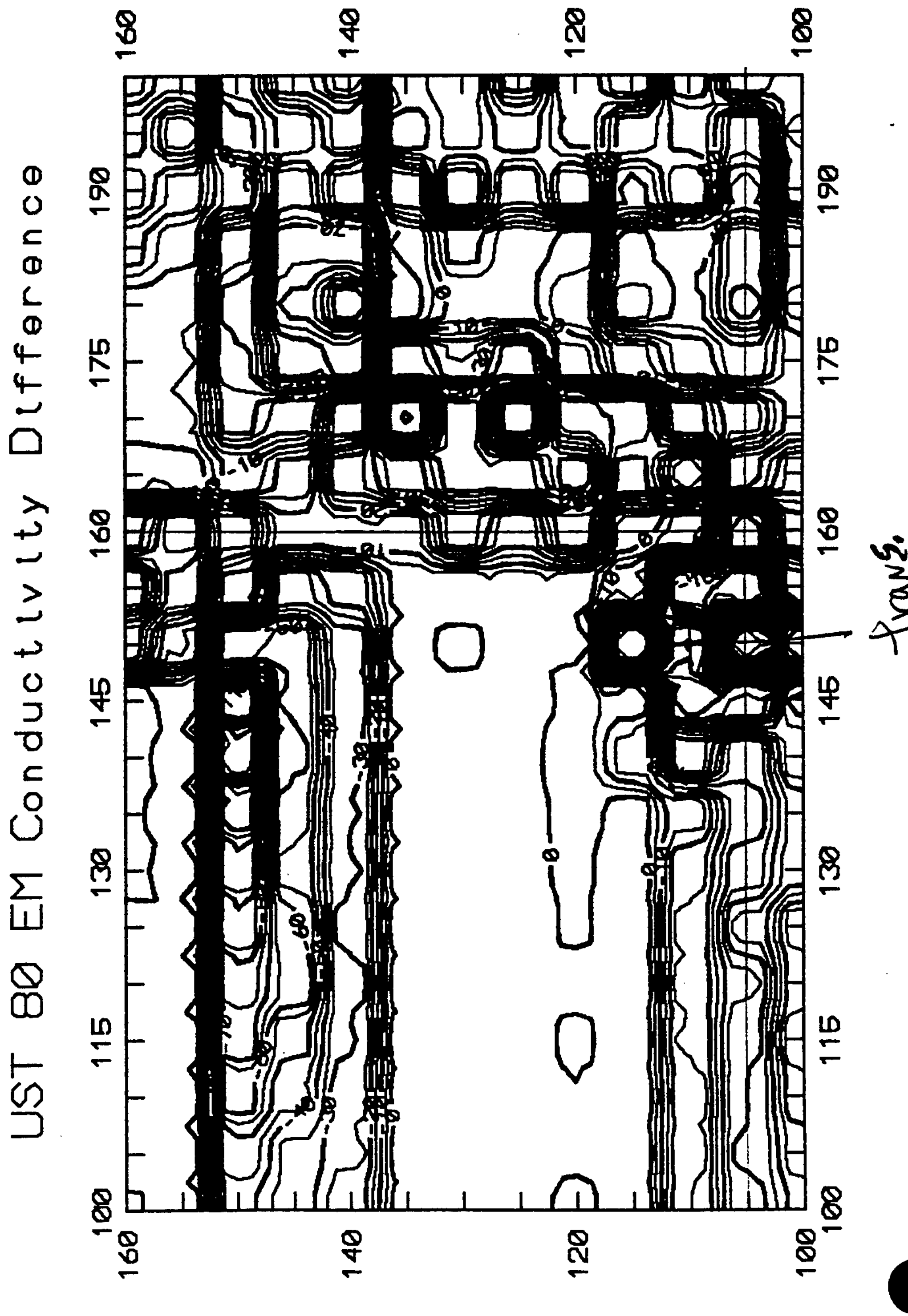
UST 80 Vertical Magnetic Gradient
100
120
140
160
180
200
100
300
500
Trans.


UST 80 EM In-Phase Difference
CI=2 ppt
trans.

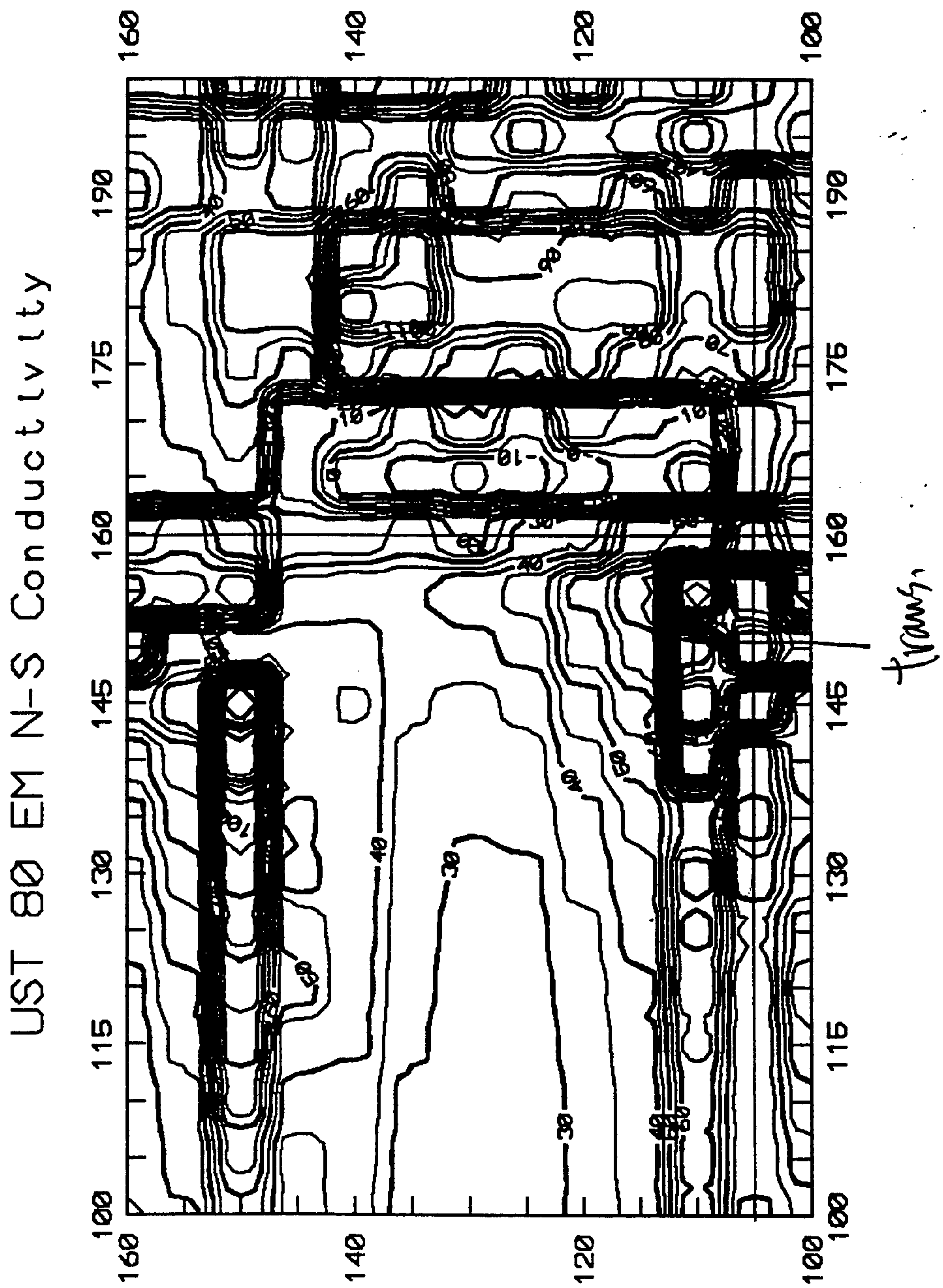

UST 80 EM In-Phase Readings
100
115
130
145
160
175
190
160
140
120
100
-2
-6
Trans.

CI = 2 ppt

CI = 5 mmho/m


UST 80 EM Conductivity Difference
100
115
130
145
160
175
190
160
140
120
100
trans.

CI = 5 mmho/m


UST 80 EM N-S Conductivity
100
115
130
145
160
175
190
140
120
trans.

INTERPRETATION NOTES
UST 81

I. SITE MAP

- 35'x140' grid, 5' spacing
- No indication of USTs based upon surficial evidence.
- The site contained a great deal of cultural interference including strong interfernce from the building and utilities. An ground-level, electrical transformer was observed to occur in the vicinity of the reported UST (Work Plan).

II. MAGNETOMETER DATA

- Interpretation of the magnetometer data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.
- However, even without additional processing, it appears that no geophysical targets of substantial size or strength appear in either the eastern third or the northwestern quarter of the surveyed area.
- In the eastern third of the survey grid, both the total and vertical magnetic gradient data were less affected by cultural interference than the EM data.

III. EM DATA

In-Phase Data

- Interpretation of the In-Phase EM data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.
- However, even without additional processing, it preliminarily appears that two geophysical targets may occur east of the transformer in the reported location of the UST (Work Plan). These preliminarily defined targets occur N105/E190 and N115/E190. It is noted that the first target (N105/E190) may be due to interference from the building, and that the second target (N115/E190) may be due to interference from the guy line/anchor or transformer.

Conductivity Data

- Interpretation of the EM Conductivity data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.

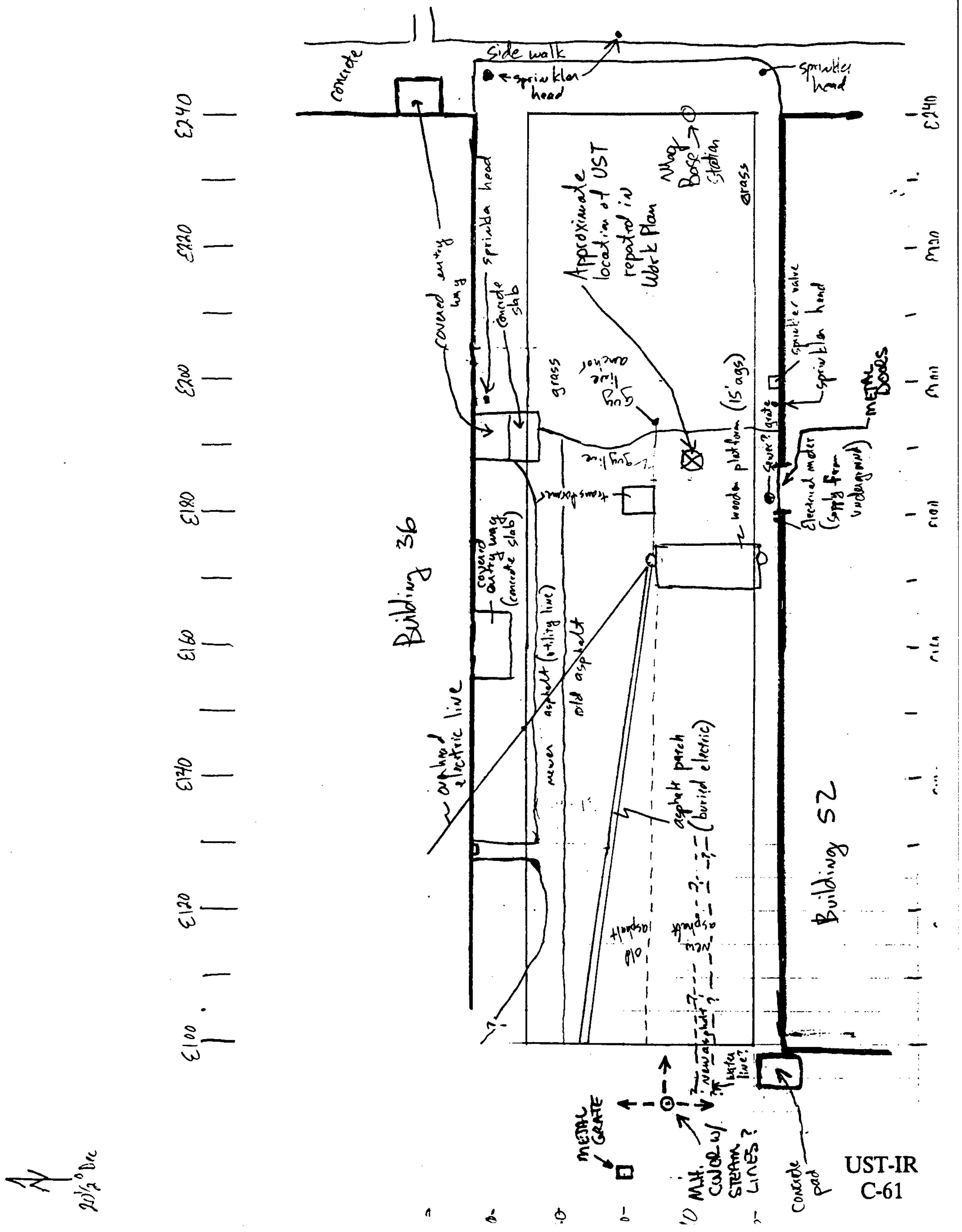
IV. CONCLUSIONS

- Both the magnetic and EM data sets need further processing. However, due to a great deal of cultural interference at the site, further processing may not result in a substantially improved interpretation.
- Although the data need further processing, two preliminarily identified anomalies are observed in the In-Phase EM data. These anomalies are located N105/E190 and N115/E190, and may be preliminarily considered possible geophysical targets.

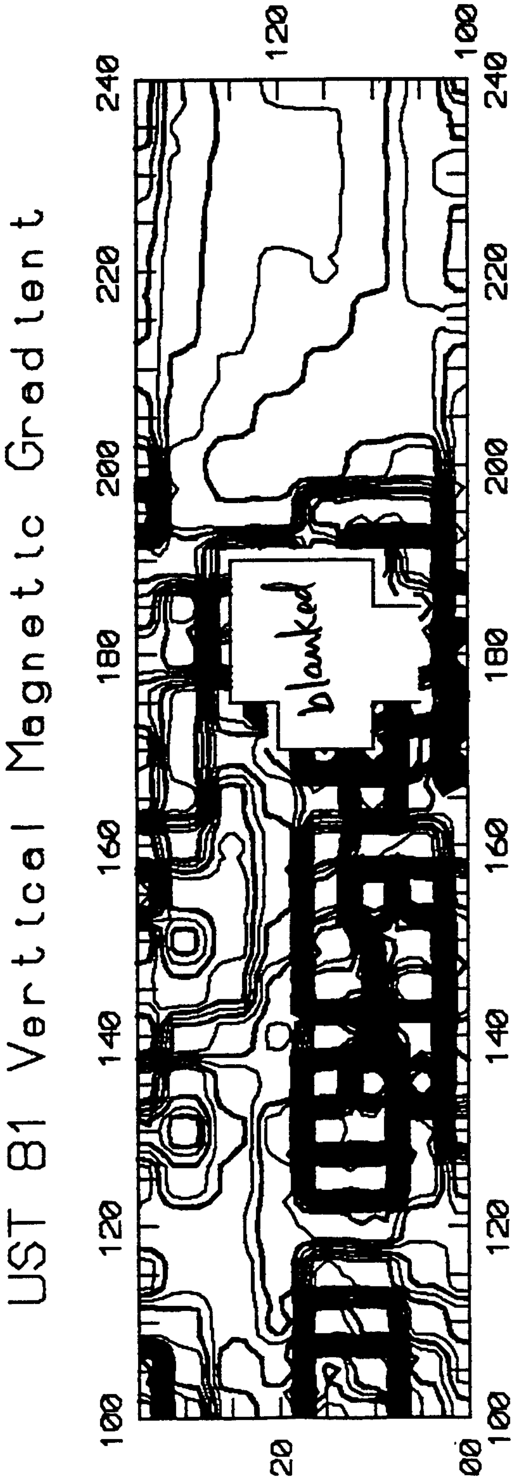
DAMES & MOORE

UST 81

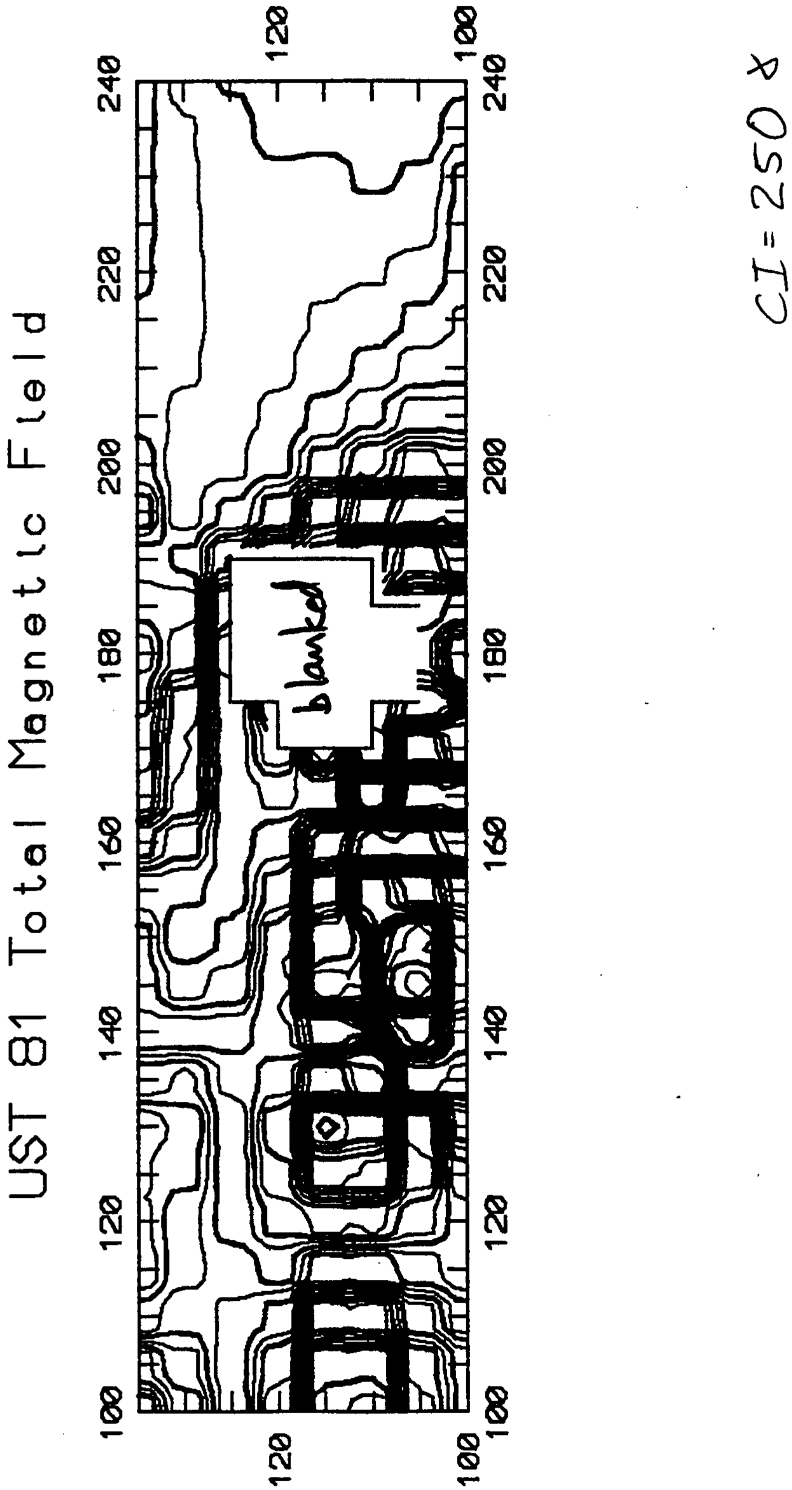
Job No.	Job	Sheet No.	
Client	Subject	Calc. No.	
		Rev. No.	
		By	Date 9/16/92
		Chk'd.	Date



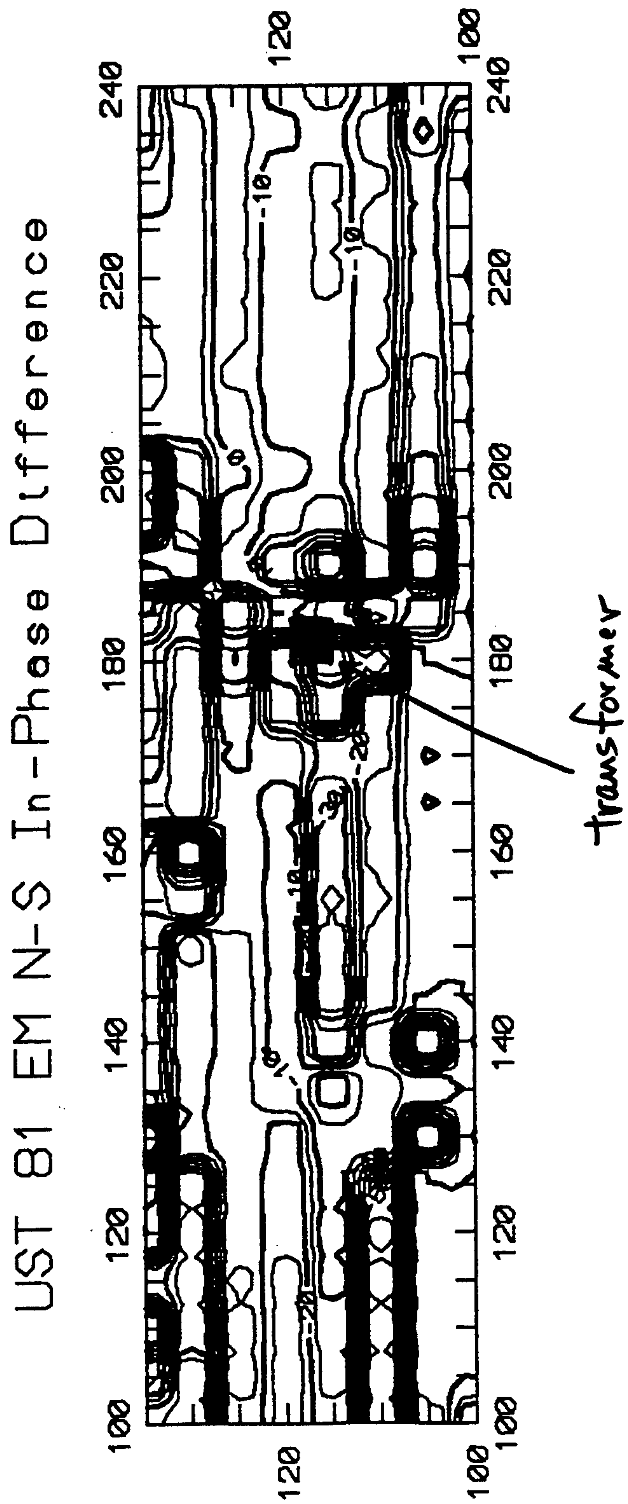
UST-IR
C-61

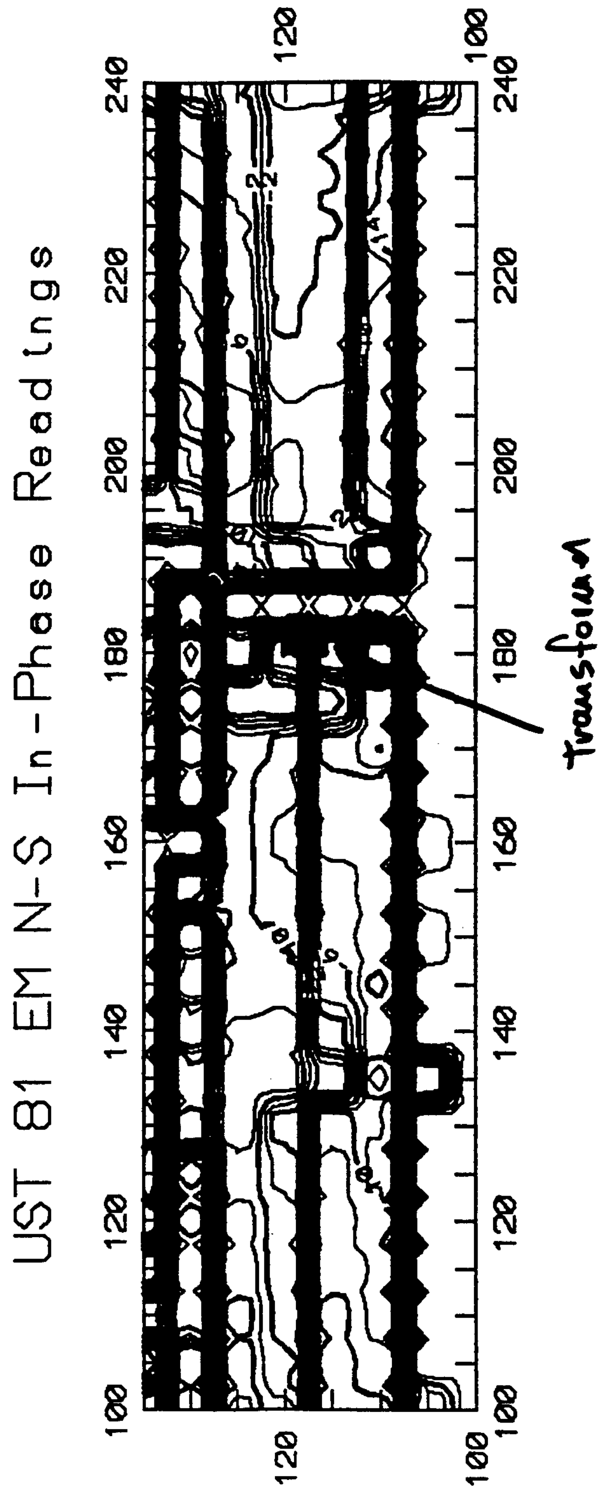

UST 81 Vertical Magnetic Gradient
blanked
100
120
140
160
180
200
220
240

CI=100γ

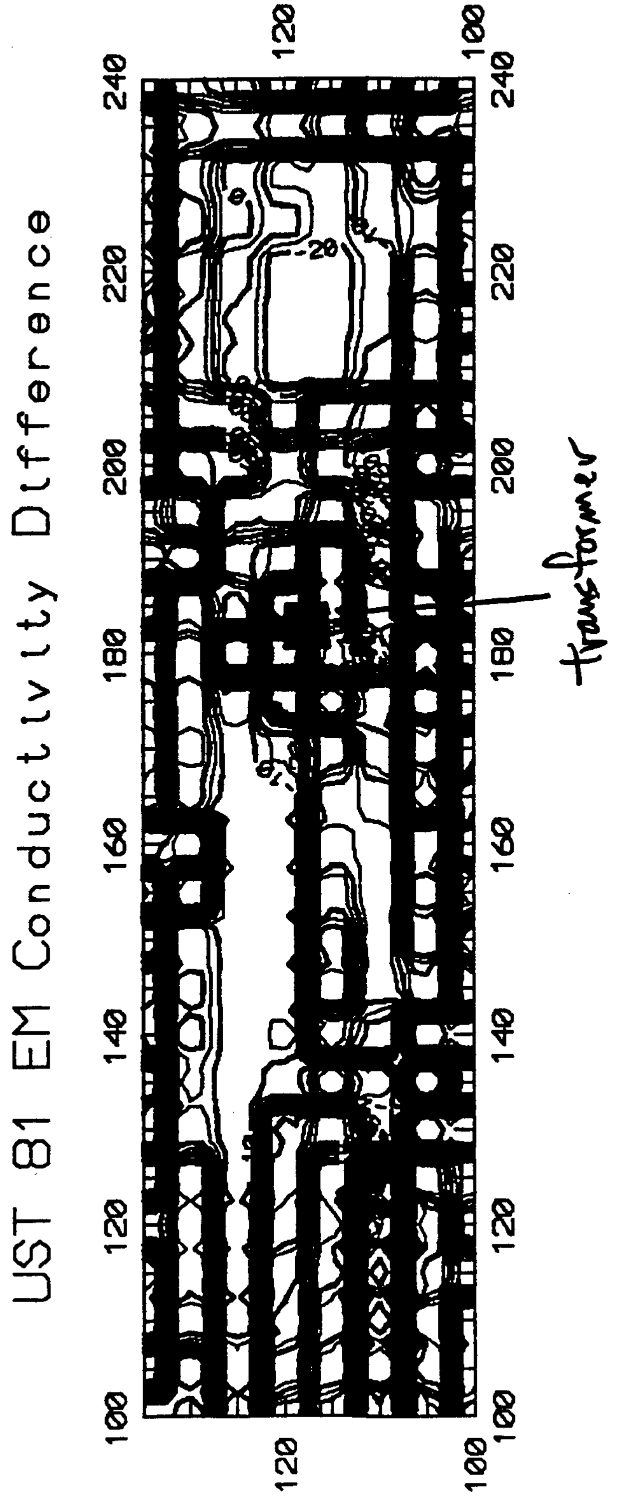

UST 81 Total Magnetic Field
blanked
100
120
140
160
180
200
220
240
CI = 250 γ

CI = 5ppt


UST 81 EM N-S In-Phase Difference
transformer
100
120
140
160
180
200
220
240

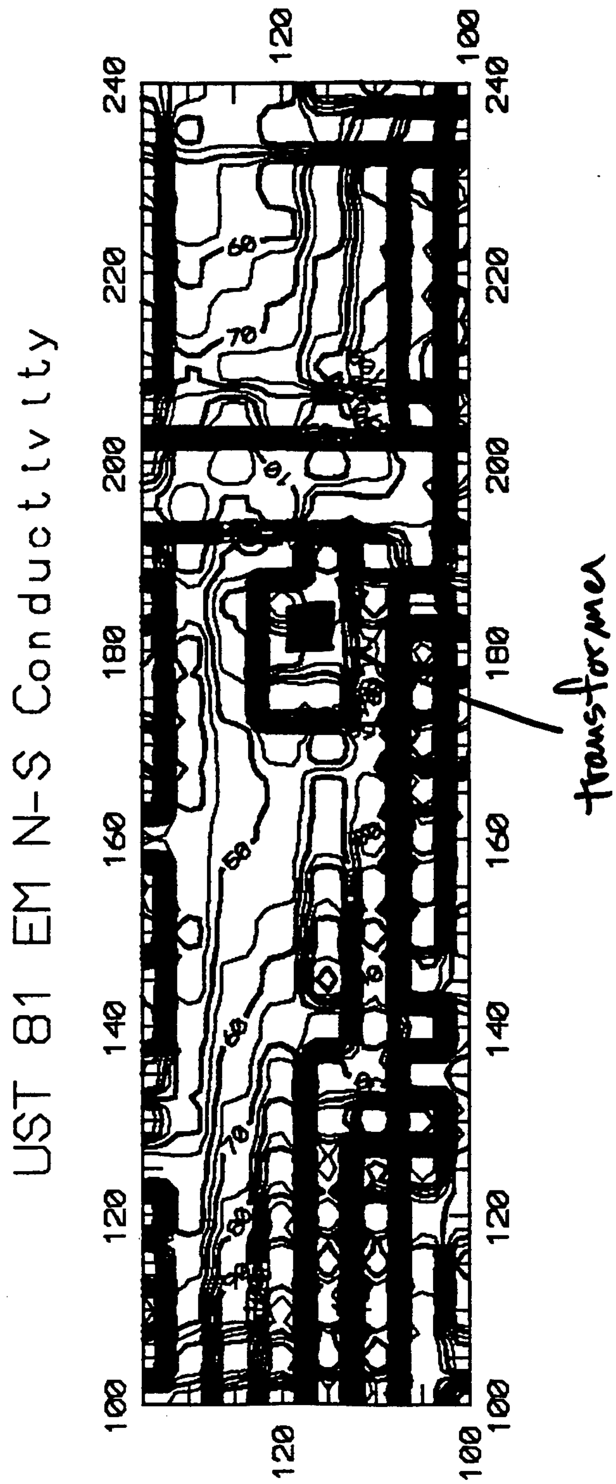

UST 81 EM N-S In-Phase Readings
transformer
100
120
140
160
180
200
220
240

CI = 2 ppt


UST 81 EM Conductivity Difference
transformer
-20
100
120
140
160
180
200
220
240

CI = 5 mmho/m

C.I. = 5 mmho/m



UST 81 EM N-S Conductivity
100
120
140
160
180
200
220
240
60
70
transformer

INTERPRETATION NOTES
UST 82

I. SITE MAP

- 80'x100' grid, 5' spacing
- Little indication of USTs based upon surficial evidence.
    - 7'x4' patch in asphalt (N115/E125) that may be the site of former UST.
- The site contained a good deal of cultural interference including strong interference from the building and utilities.

II. MAGNETOMETER DATA

- Several anomalies are observed in the magnetic data. Most of these anomalies appear result from cultural interference (utilities, building,etc.) A remaining anomaly is located N150-155/E160-170. This magnetic anomaly does not appear as an anomaly in the EM data.
  This magnetic anomaly is not interpreted to be a geophysical target because of its response, and because it is not confirmed by EM data.

III. EM DATA

In-Phase Data

- Interpretation of the In-Phase EM data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.
- However, even without additional processing, it preliminarily appears that no geophysical targets occur in the northern half of the surveyed area.

Conductivity Data

- Interpretation of the EM Conductivity data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.
- However, even without additional processing, it preliminarily appears that no geophysical targets occur in the northern half of the surveyed area.

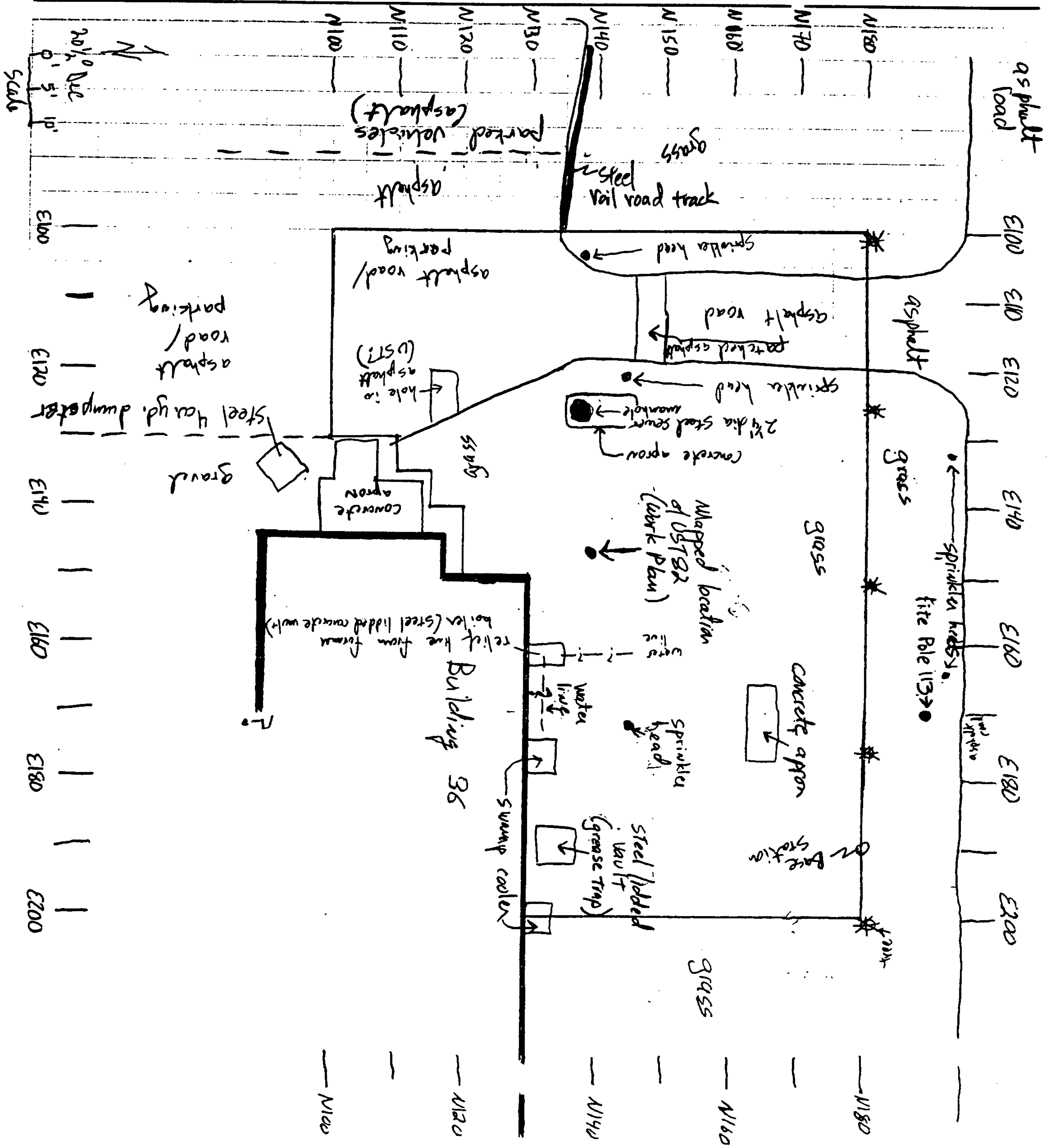
IV CONCLUSIONS

- The EM data need further processing due to the amount of cultural interference encountered at the site.
- No geophysical targets were identified in the northern half of the surveyed area in the EM data, or to the west of E120 in the EM and magnetic data.

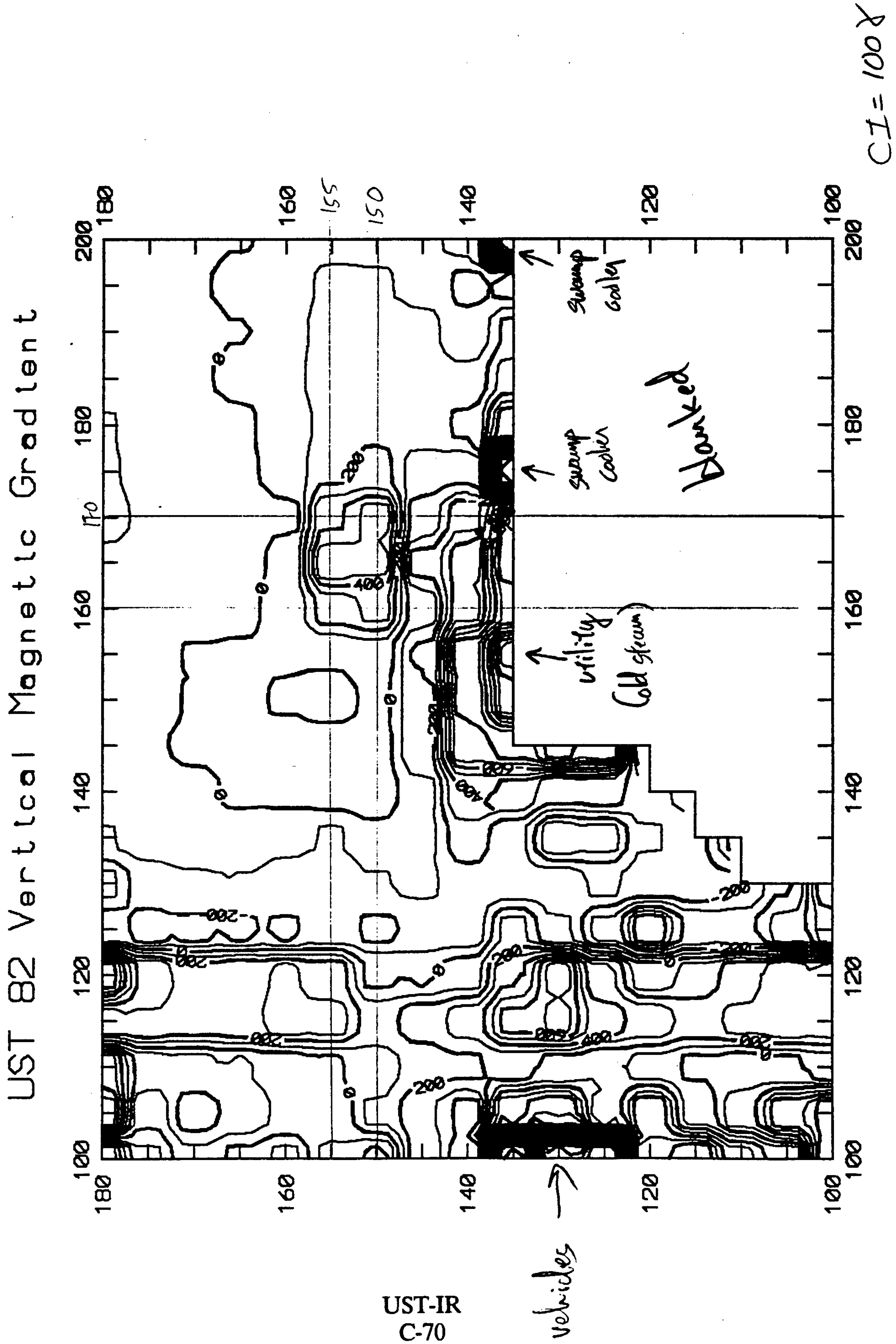
DAMES & MOORE

UST 82

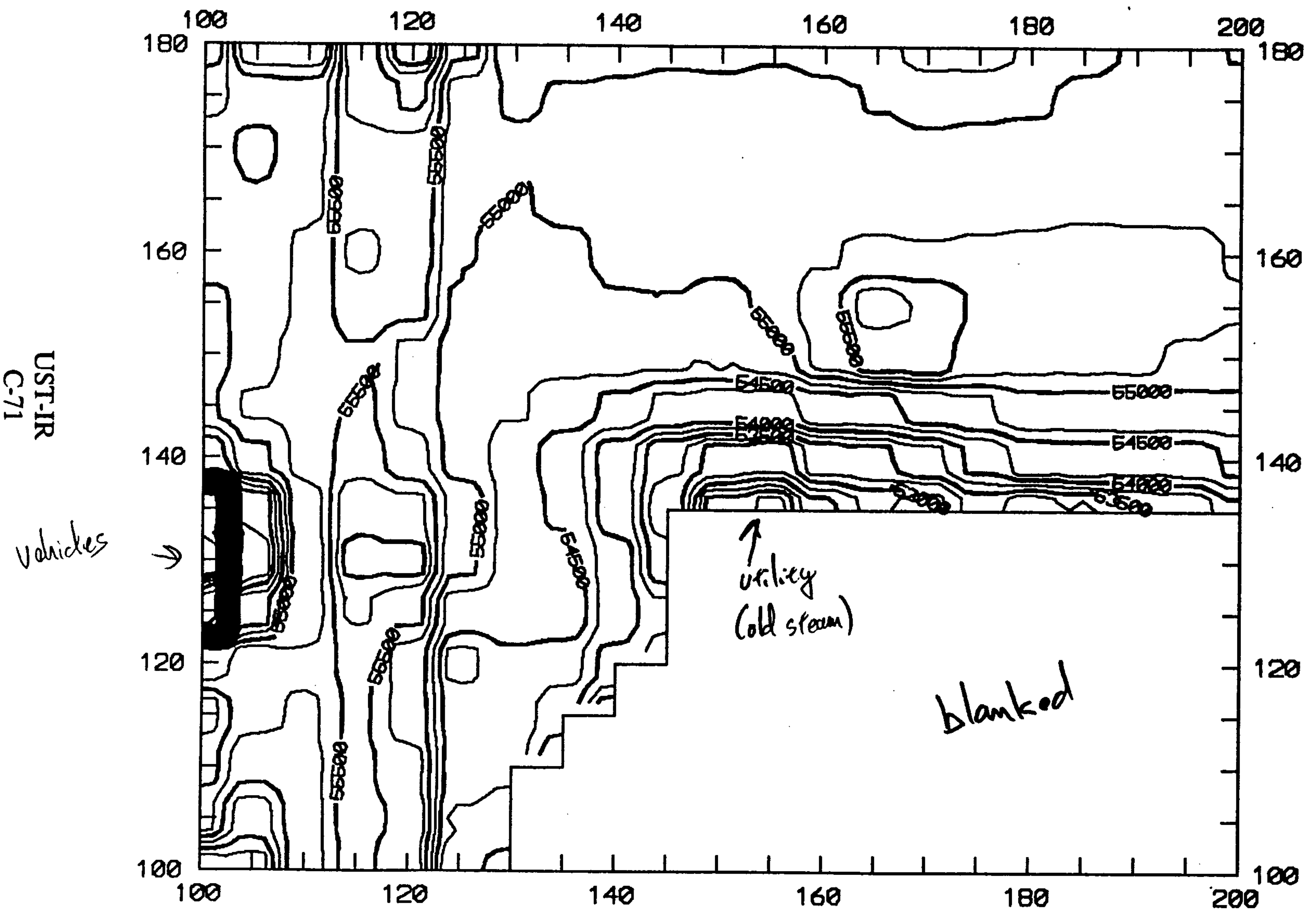
Job No.	Job	Sheet No.
		Calc. No.
		Rev. No.
		By / Date 9/16/92
Client	Subject	Chk'd. / Date



946.9 (7/91)

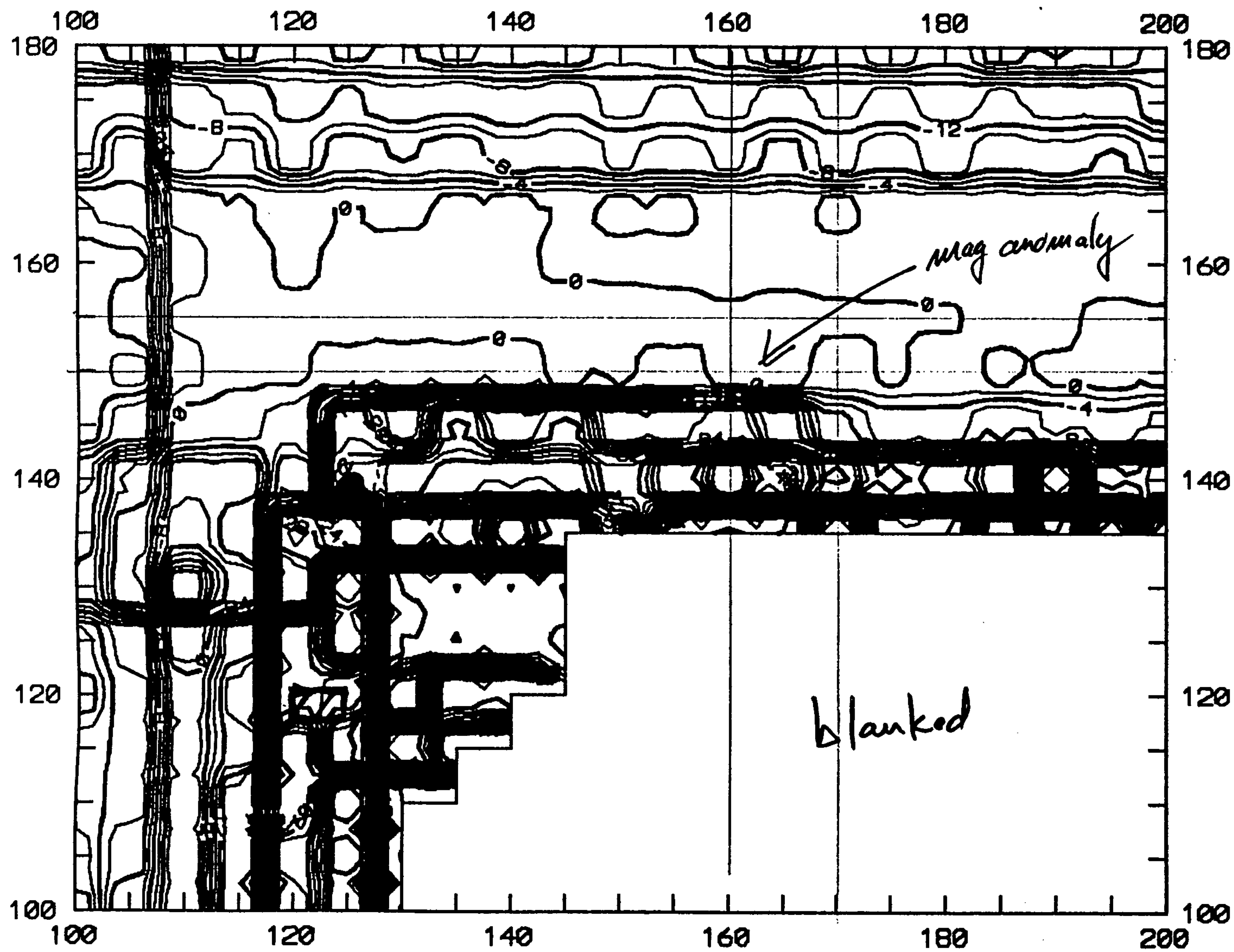

UST 82 Vertical Magnetic Gradient
CI = 100γ
vehicles
utility
Cold steam
swamp cooler
swamp cooler
blanked
155
150
170
0
200
400
600
180
160
140
120
100

UST 82 Total Magnetic Field

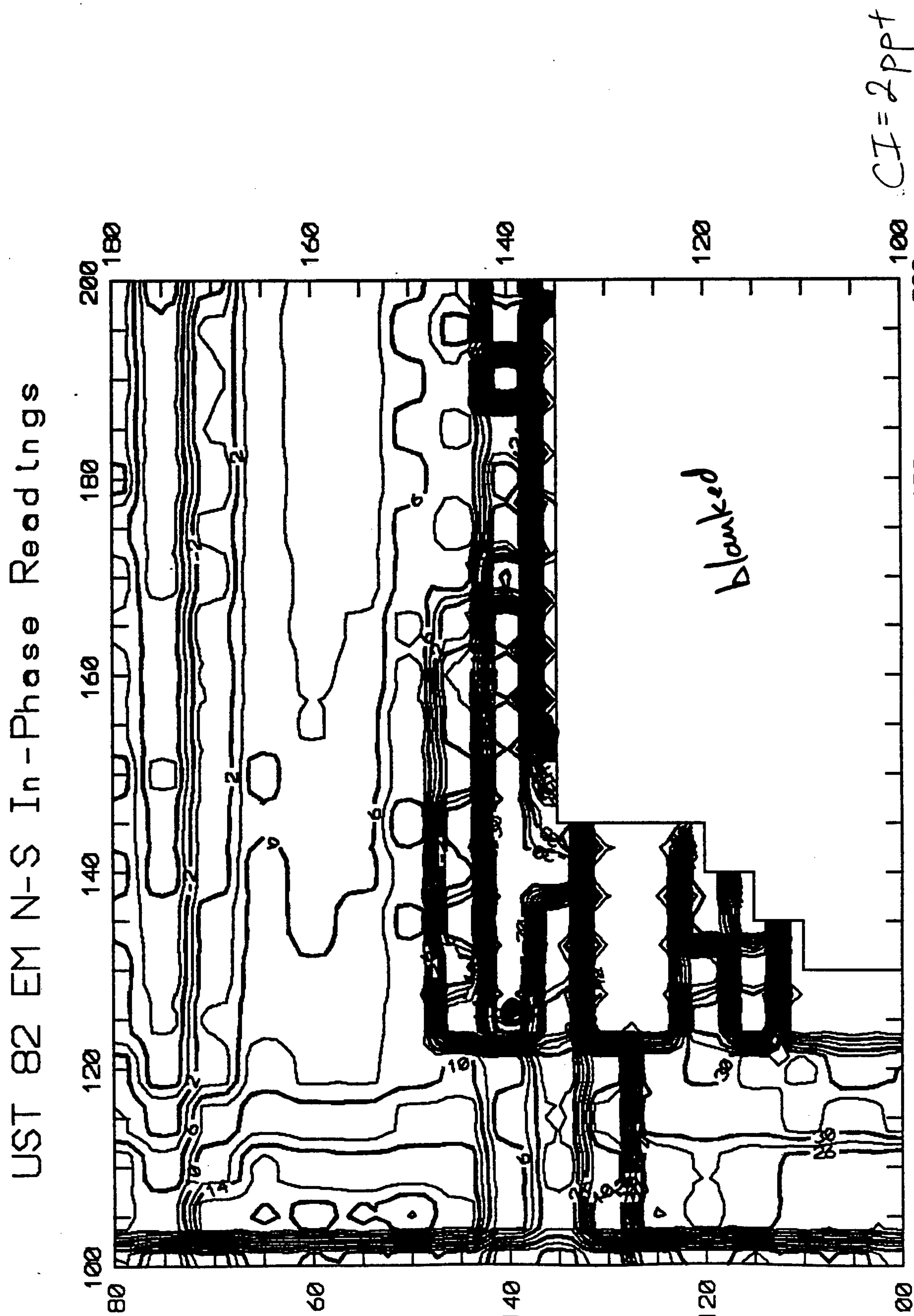


CI=250 γ

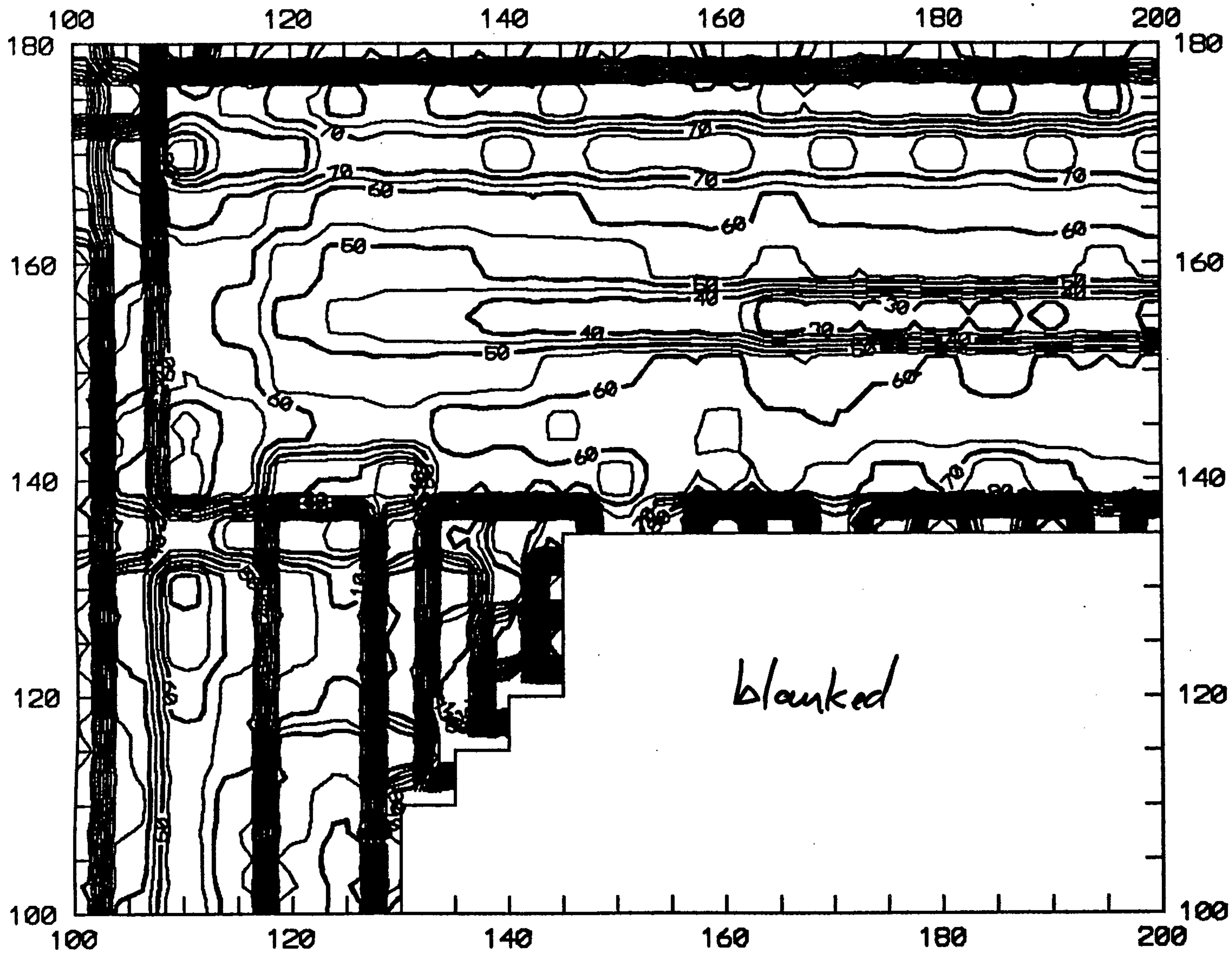
UST 82 EM N-S In-Phase Difference



CI = 2 ppt

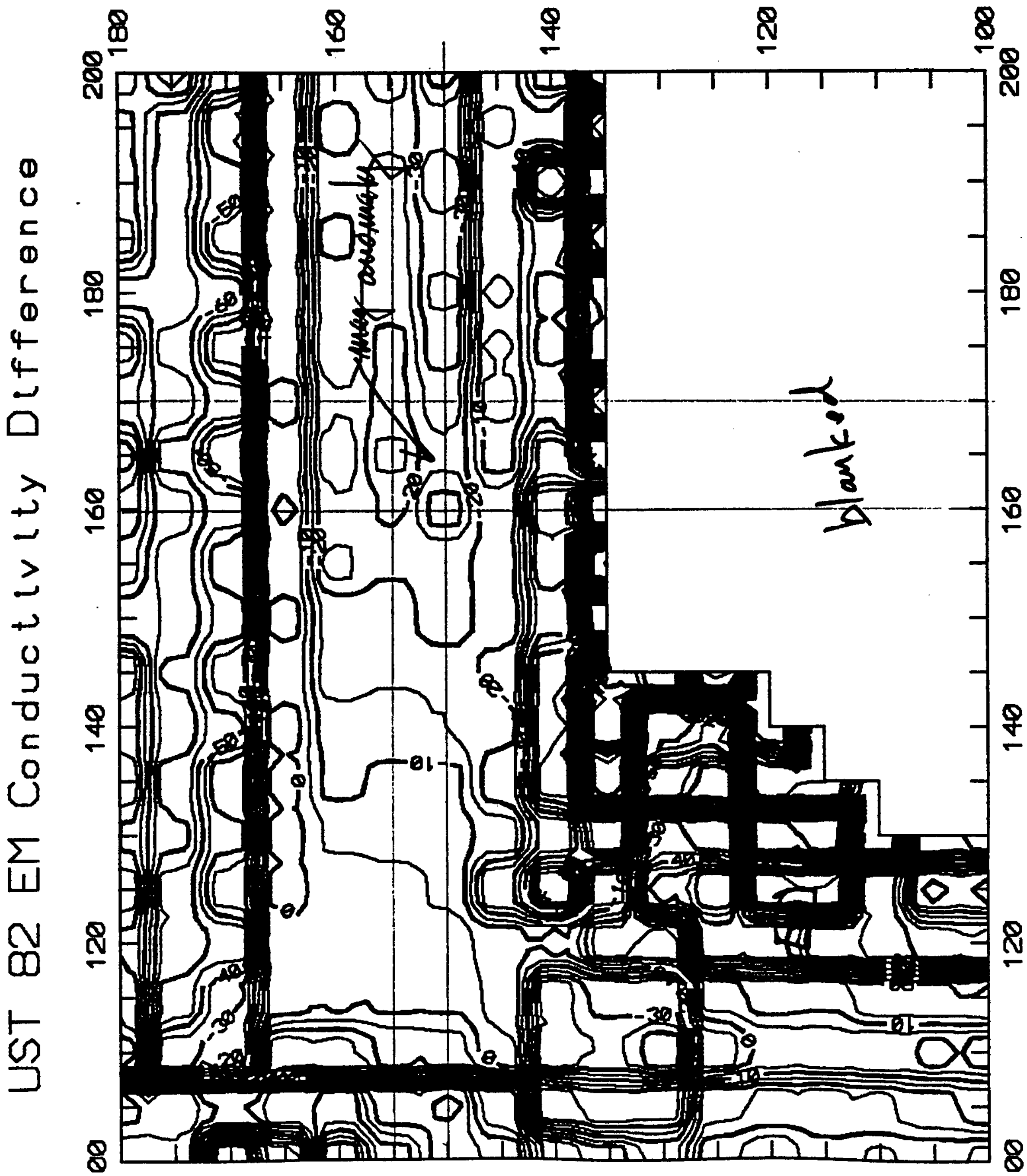

UST 82 EM N-S In-Phase Readings
CI = 2ppt
blanked
100
120
140
160
180
200

UST 82 EM N-S Conductivity



C I = 5 mmho/m

CI = 5 mmho/m



INTERPRETATION NOTES
UST 84

I. SITE MAP

- 100'x120' grid, 5' spacing
- Little indication of USTs based upon surficial evidence.
    - Break in asphalt covering N150-165/E135.
- The site contained some cultural interference due to underground utilities, fences, building, etc.

II. MAGNETOMETER DATA

- Interpretation of the magnetic data is hindered by the large amount of cultural interference encountered at the site. We recommend that further processing be undertaken to enhance the interpretation.

III. EM DATA

<u>In-Phase Data</u>

- The EM In-Phase anomalies observed in the data sets appear to be associated with underground utilities, the fence, or the building.
- Additional processing may enhance interpretation.

<u>Conductivity Data</u>

- The EM Conductivity anomalies observed in the data sets appear to be associated with underground utilities, the fence, or the building.
- Additional processing may enhance interpretation.

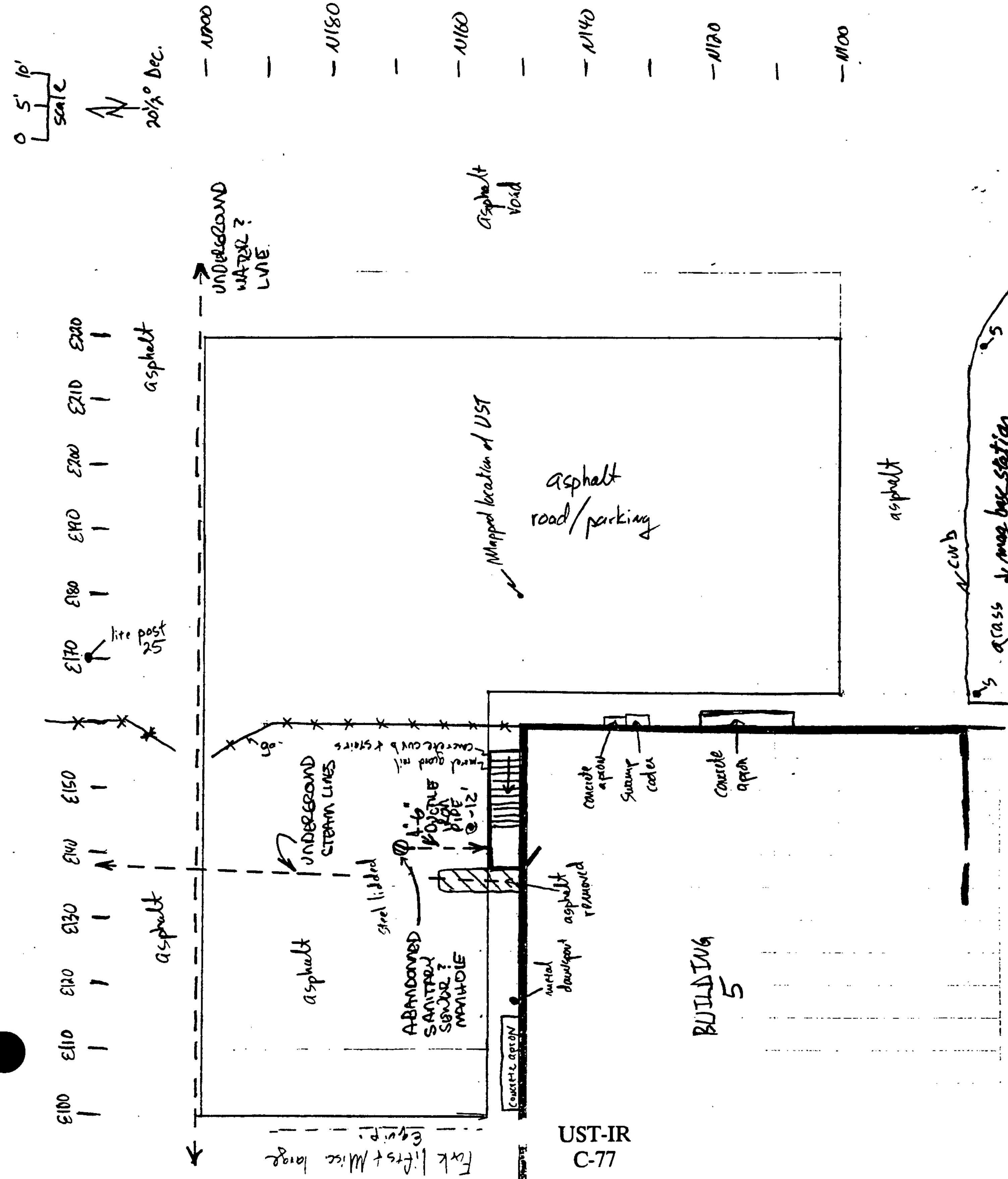
IV. CONCLUSIONS

- The magnetic data need additional processing due to the amount of cultural interference encountered at the site.
- Although the magnetic data need additional processing, it appears that no geophysical targets are identifed in the EM data.

DAMES & MOORE

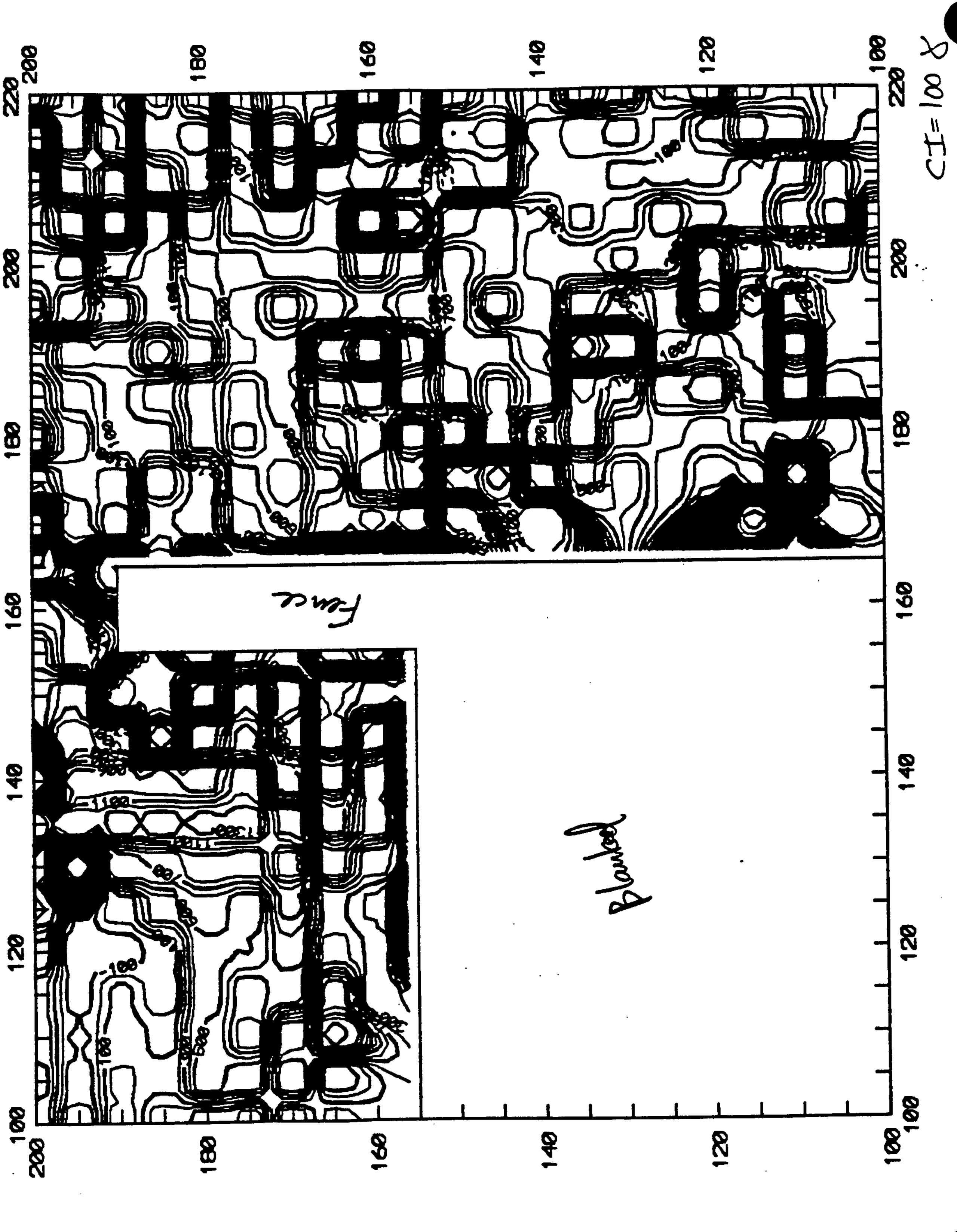
UST 84

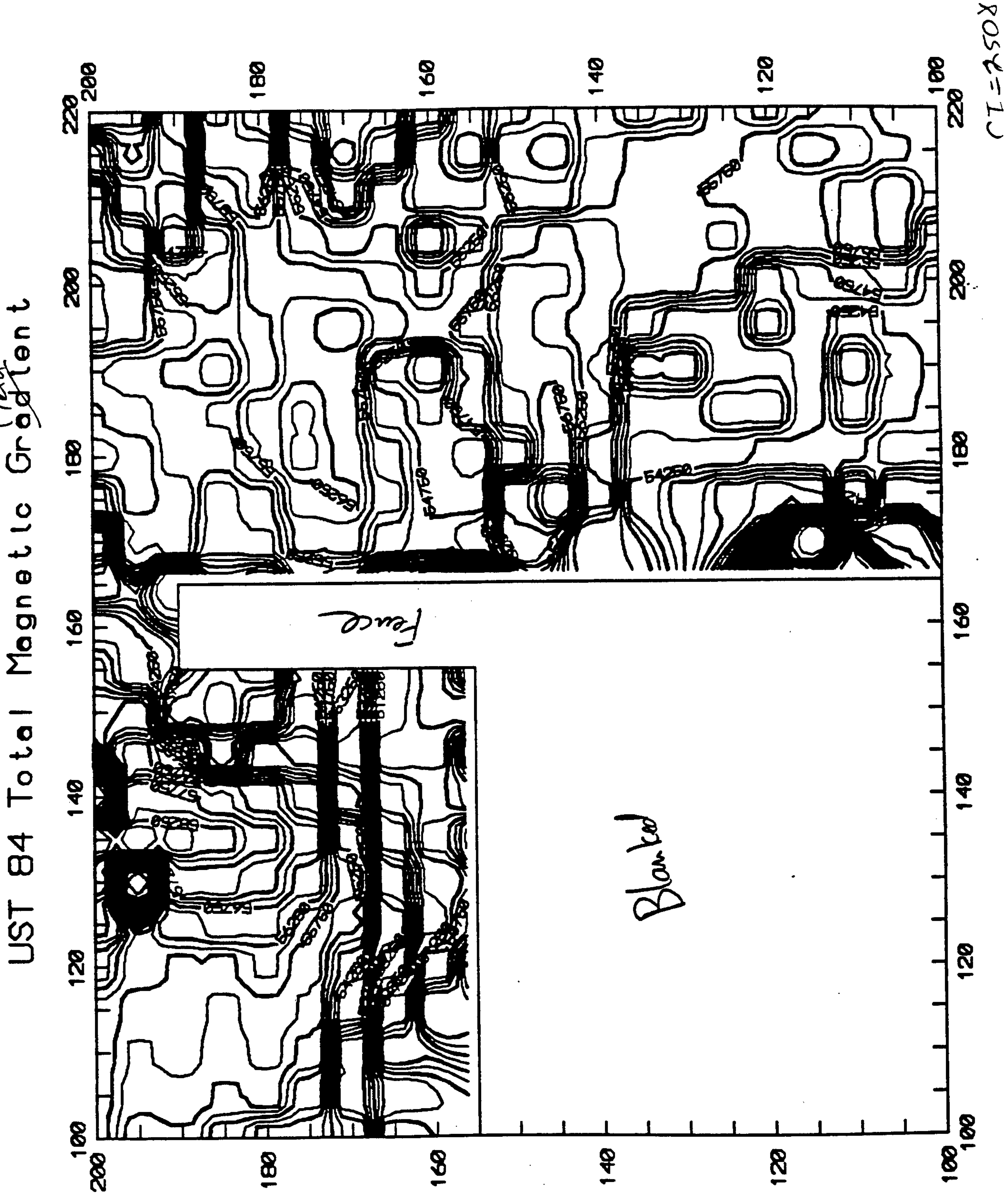
Sheet No.			
Calc. No.			
Rev. No.			
Job No.	Job	By JMA	Date 9/24
Client	Subject	Chk'd.	Date



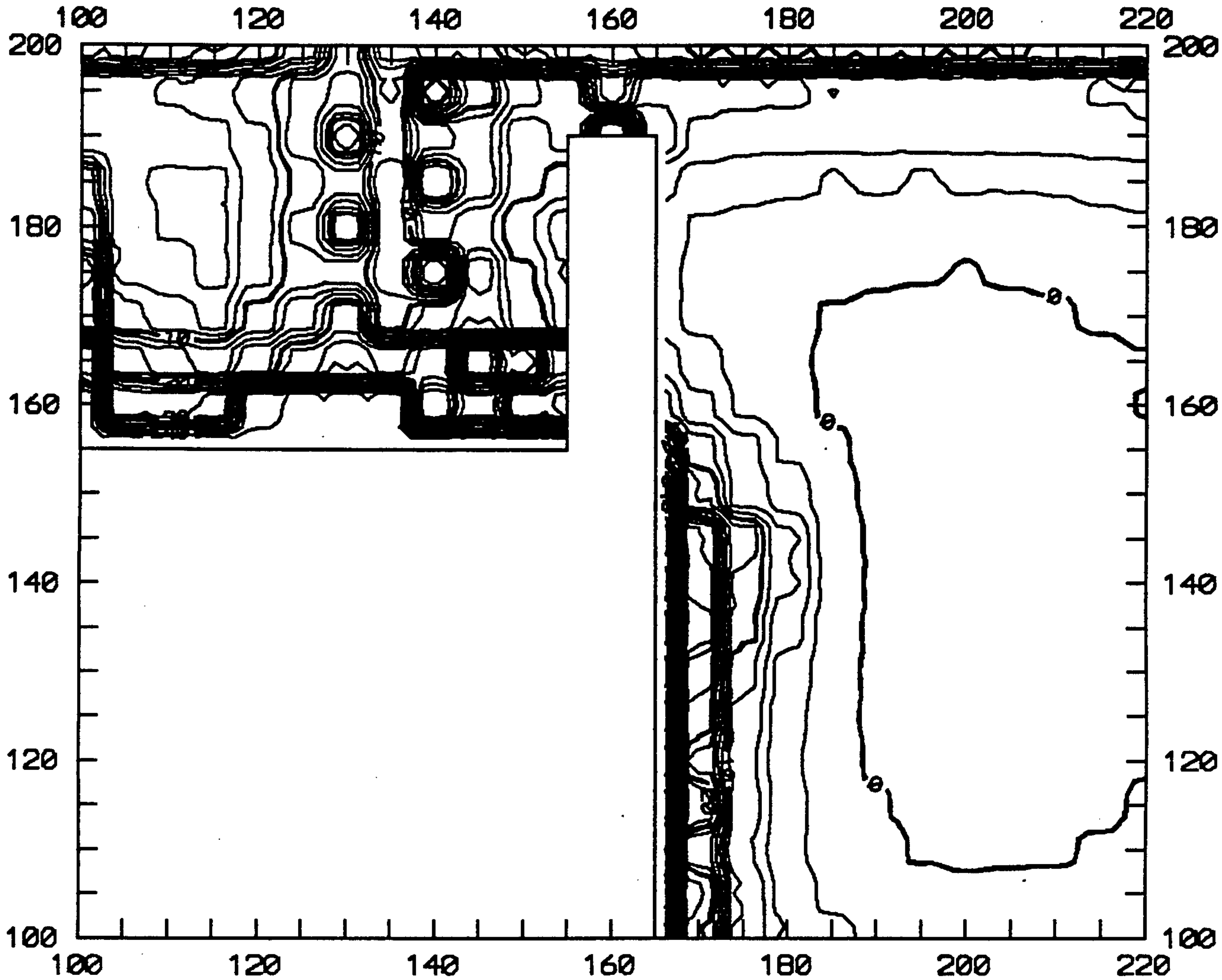
UST-IR
C-77

UST 84 Vertical Magnetic Gradient



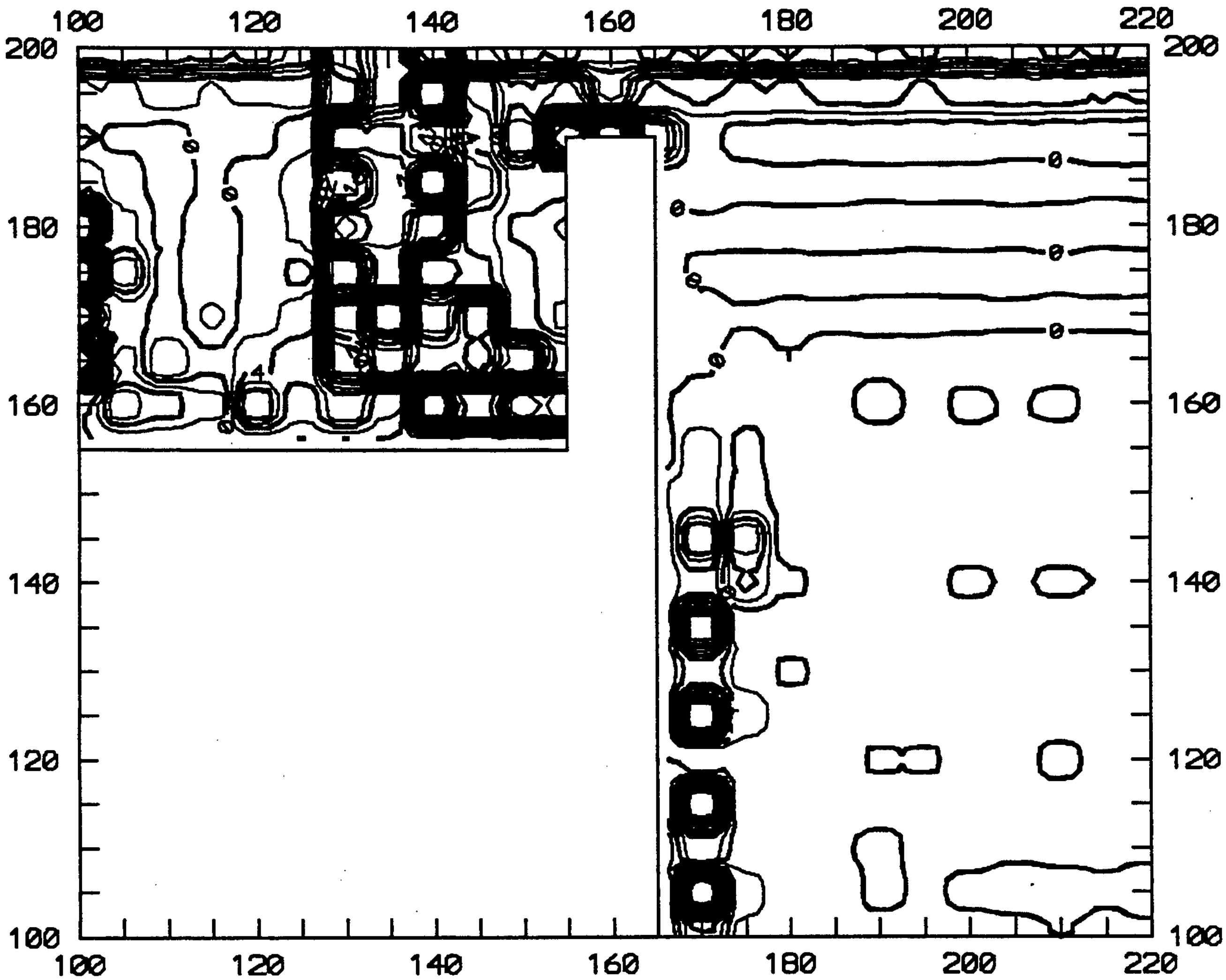

UST 84 Total Magnetic Field Gradient
Fence
Blanked
CI=250

UST 84 EM N-S In-Phase Readings



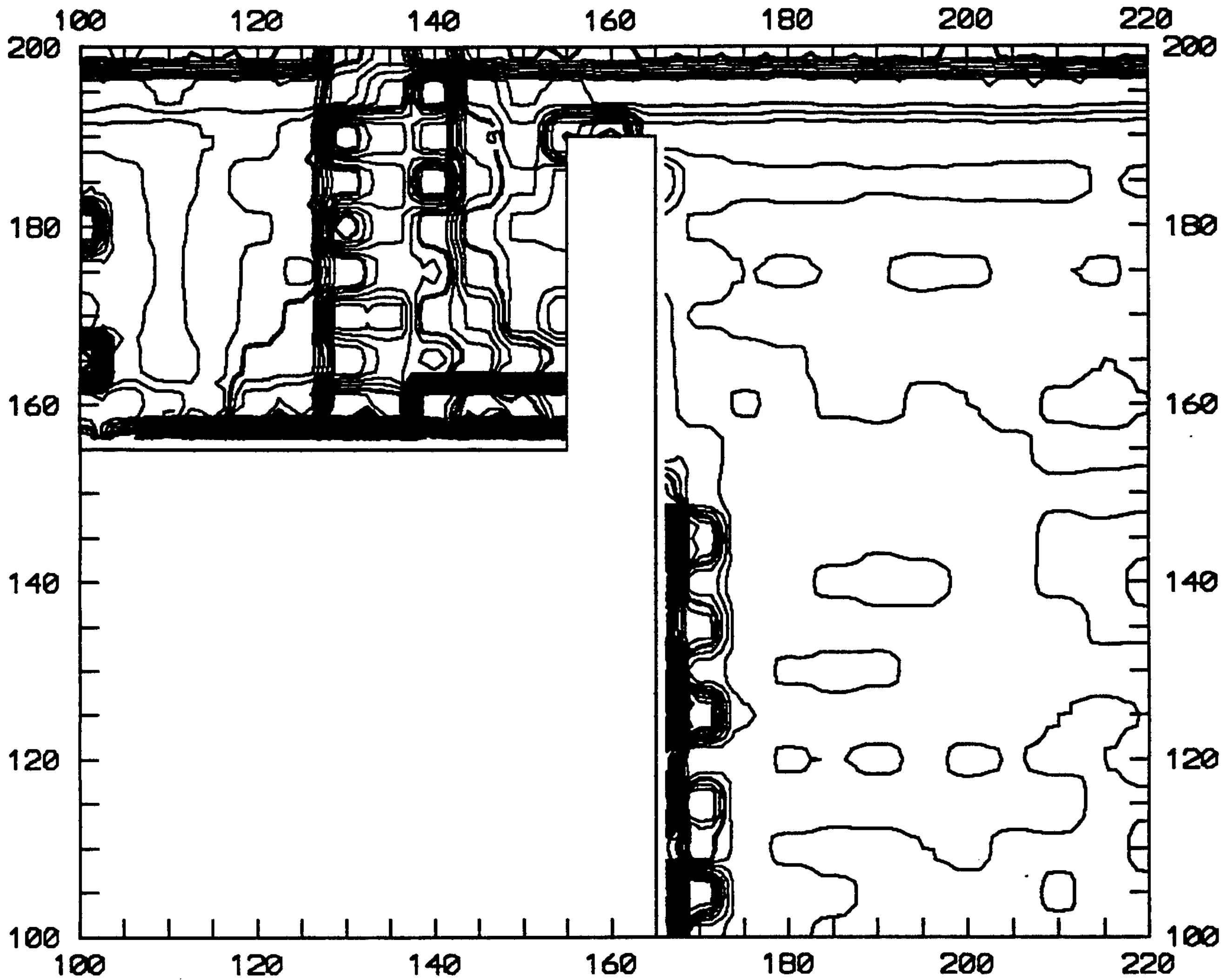
CI = 2 ppt

UST 84 EM In-Phase Difference



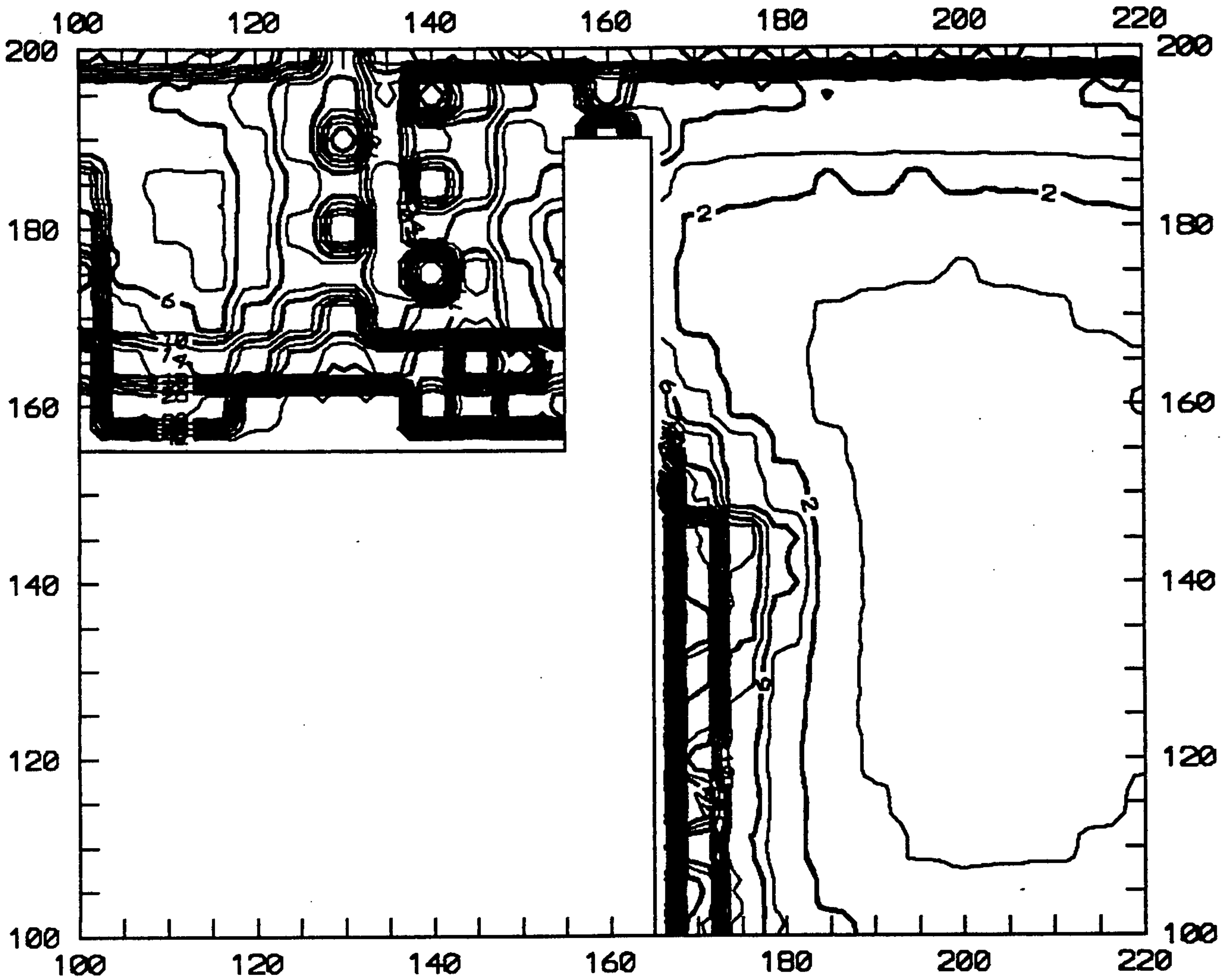
CI= 2ppt

UST 84 EM Conductivity Difference



CI = 5 mmho/m

UST 84 EM N-S Conductivity



CI = 2 mmho/m

INTERPRETATION NOTES
UST 86

I. SITE MAP
- 200'x200' grid, 5' and 10' spacing
- Little indication of USTs based upon surficial evidence.
  - Slight depression (4'x4') centered N245/E265.

II. MAGNETOMETER DATA
- Several magnetic anomalies are observed in the vertical magnetic gradient and total field data sets. All but two of these anomalies appear to result from cultural interference.

  Anomaly 1 (N280/E170)- The size and strength of this magnetic anomaly suggest that it be considered a geophysical target. However, since this magnetic anomaly does not appear in the EM data sets, it is not considered a target.

  Anomaly 2 (N240/E250)- This magnetic anomaly nearly coincides with both surface evidence and with EM anomalies. Upon staking this anomaly it was discovered to be a 4'x5' steel-lidded vault cover buried less than 1' below ground surface.

III. EM DATA

In-Phase Data
- One strong anomaly is observed in the In-Phase Difference map. The anomaly is located N250/E260-270. This location is nearly coincidental to both the magnetic anomaly and surface evidence. Upon staking this anomaly it was discovered to be a 4'x5' steel-lidded vault cover buried less than 1' below ground surface.

Conductivity Data
- One moderately strong anomaly is observed in the Conductivity Difference map. The anomaly is located N250/E260-270. This location is nearly coincidental to both the magnetic anomaly and surface evidence. Upon staking this anomaly it was discovered to be a 4'x5' steel-lidded vault cover buried less than 1' below ground surface.

IV. CONCLUSIONS
- One strong to moderately strong anomaly was observed in the EM and magnetic data sets. Surface evidence (depression) also was observed in the area of the anomaly. The anomaly was considered a geophysical target, but upon staking the target in the field, it was discovered to be a 4'x5' steel-lidded vault cover buried less than 1' below ground surface.
- It is reassuring to note that the response from this shallow-buried plate was not as great as the response from the known UST at the test survey (UST 34) or from Site UST 102.

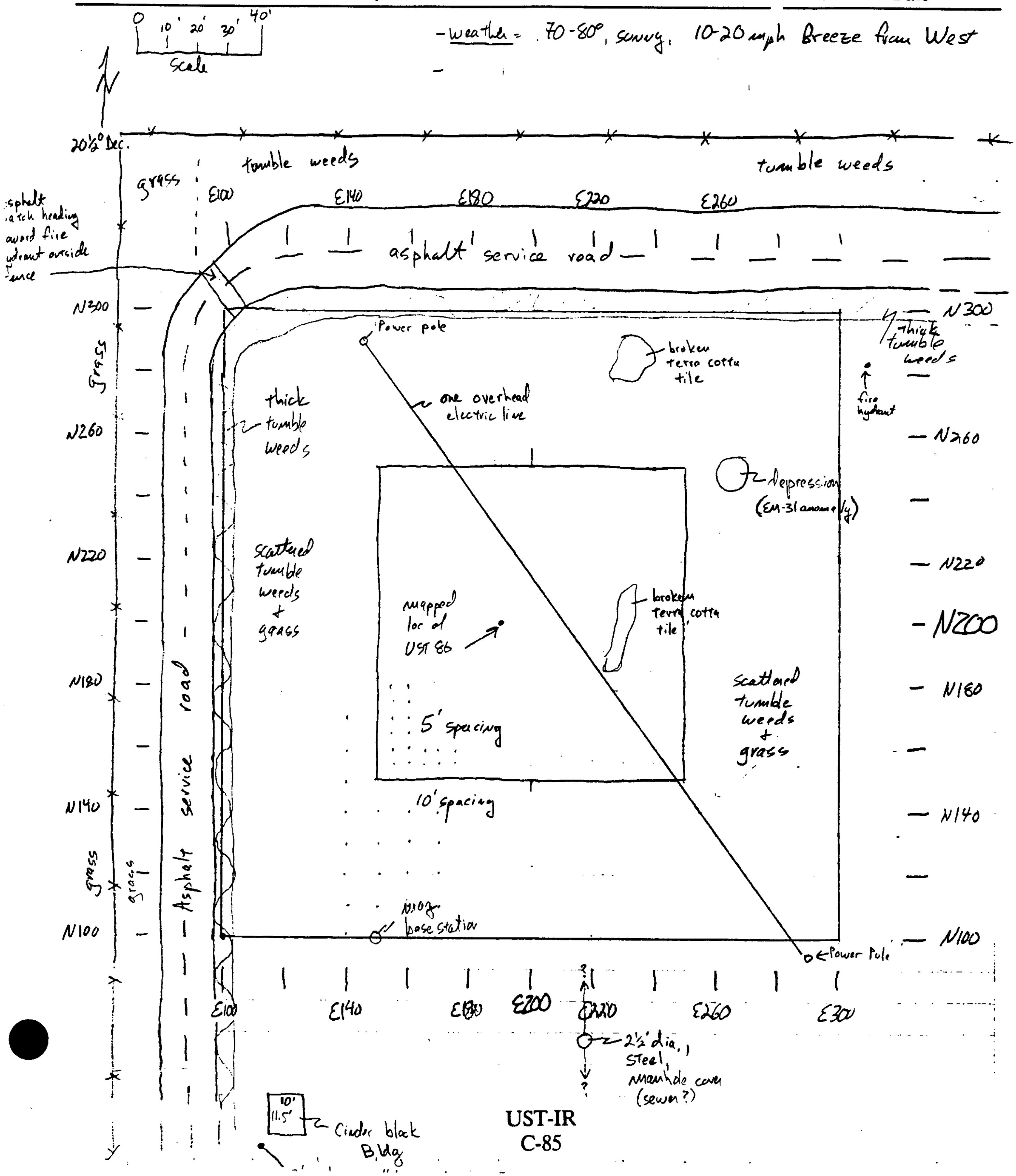
DAMES & MOORE VST 26

Sheet No.	
Calc. No.	
Rev. No.	
By	Date 9/12/92
Chk'd.	Date

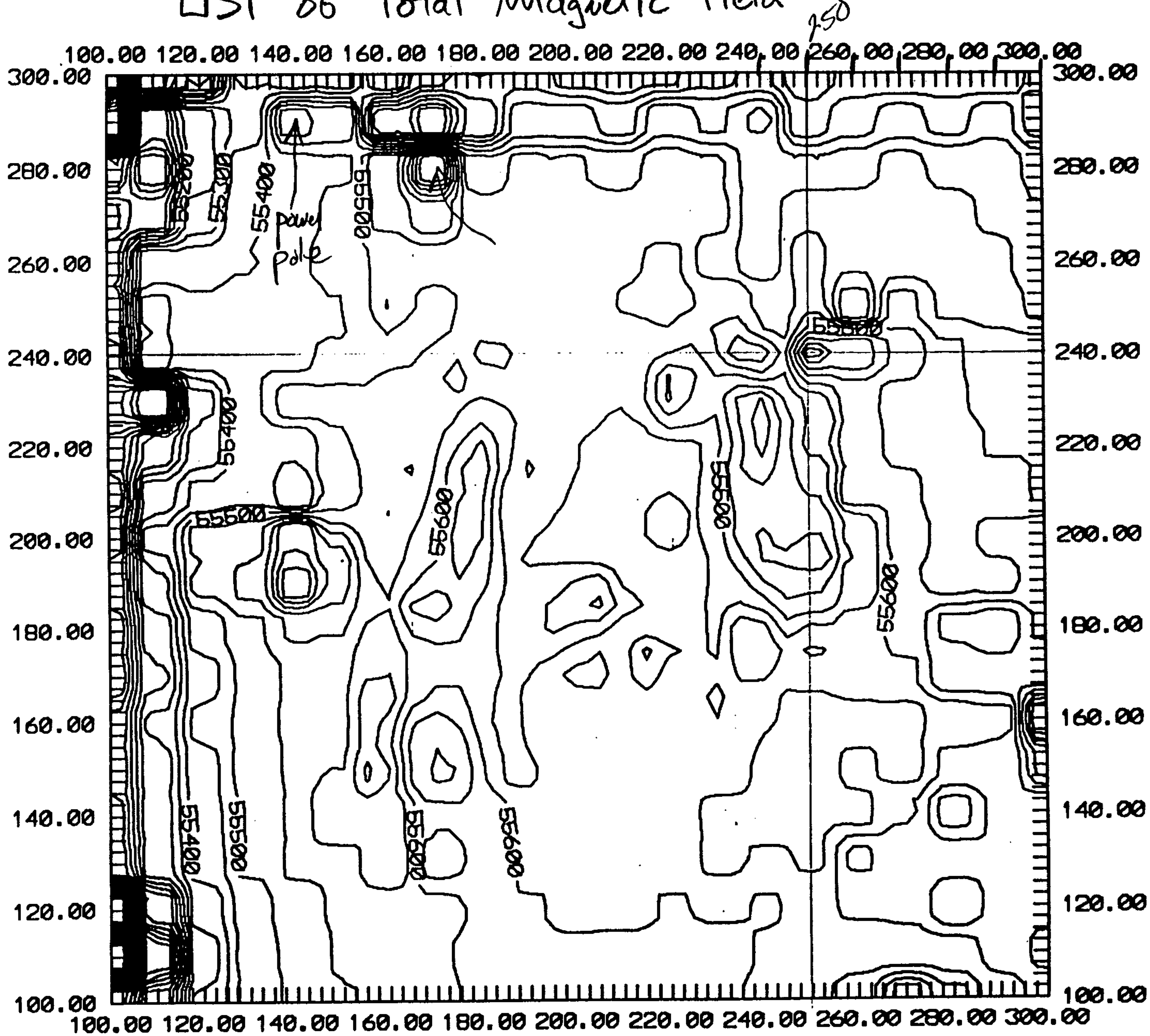
Job No. Job

Client Subject

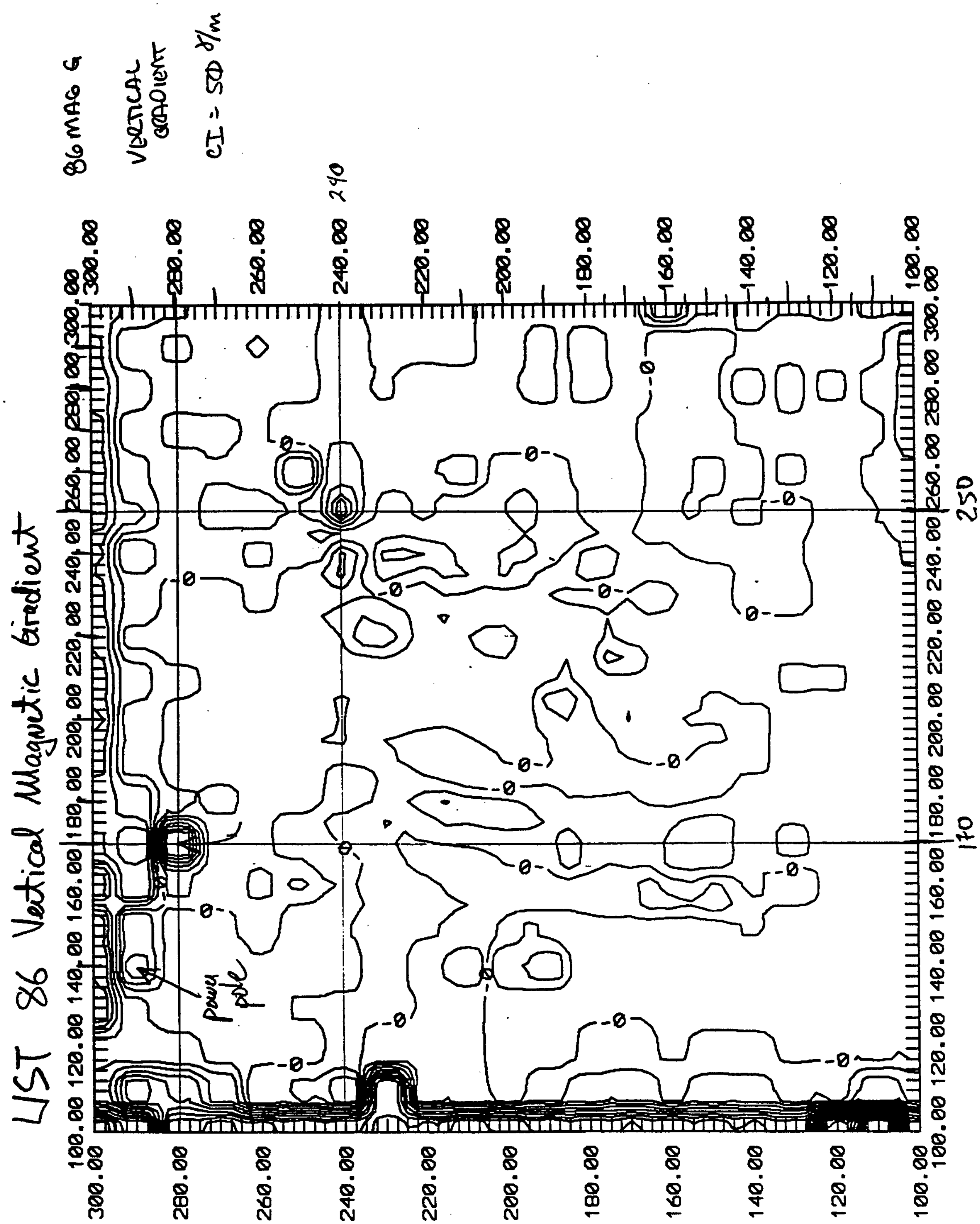
-weather = 70-80°, sunny, 10-20 mph Breeze from West

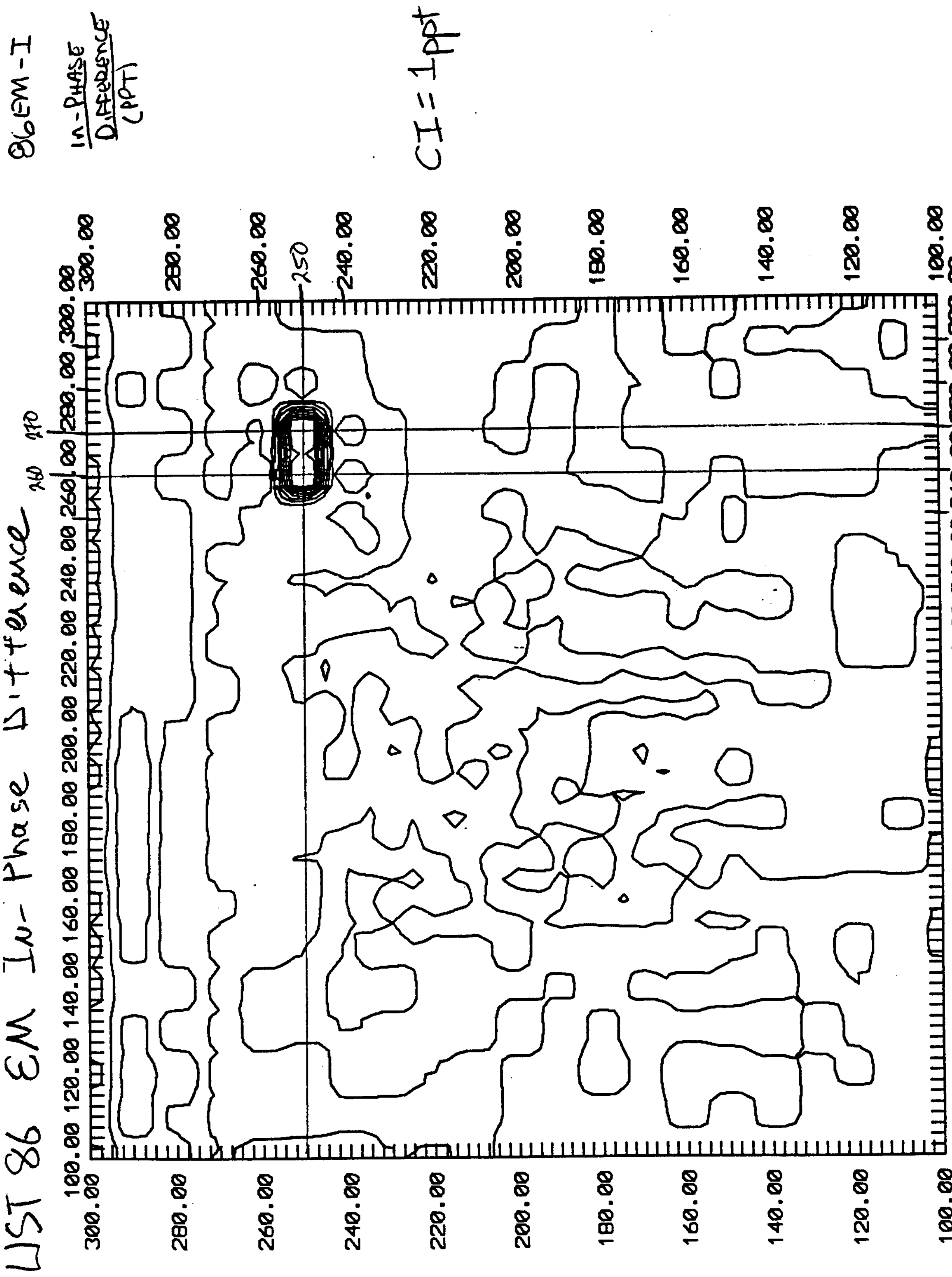


UST 86 Total Magnetic field



86MAG T
TOTAL FIELD
CI=50 γ


UST 86 Vertical Magnetic Gradient
86 MAG G
VERTICAL GRADIENT
CI = 50 γ/m
power pole
240
250
170
100.00
120.00
140.00
160.00
180.00
200.00
220.00
240.00
260.00
280.00
300.00

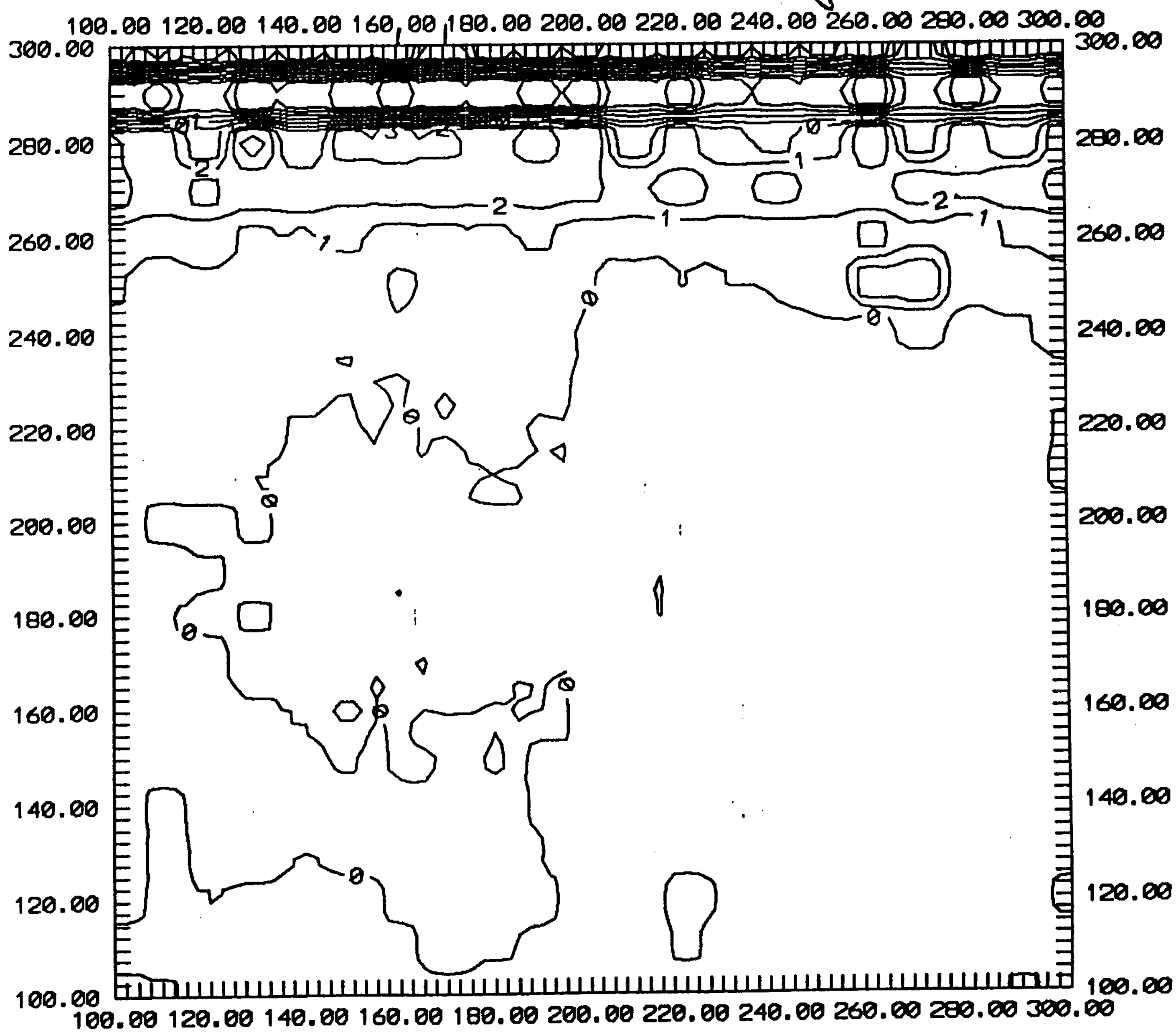

UST 86 EM In-Phase Difference
86EM-I
In-Phase Difference (PPT)
CI = 1ppt
250
260
270
100.00 120.00 140.00 160.00 180.00 200.00 220.00 240.00 260.00 280.00 300.00
300.00 280.00 260.00 240.00 220.00 200.00 180.00 160.00 140.00 120.00 100.00

UST 86 EM NS In-Phase Readings

86EM1I

Orientation #1 (N-S)

In-Phase (PPT)



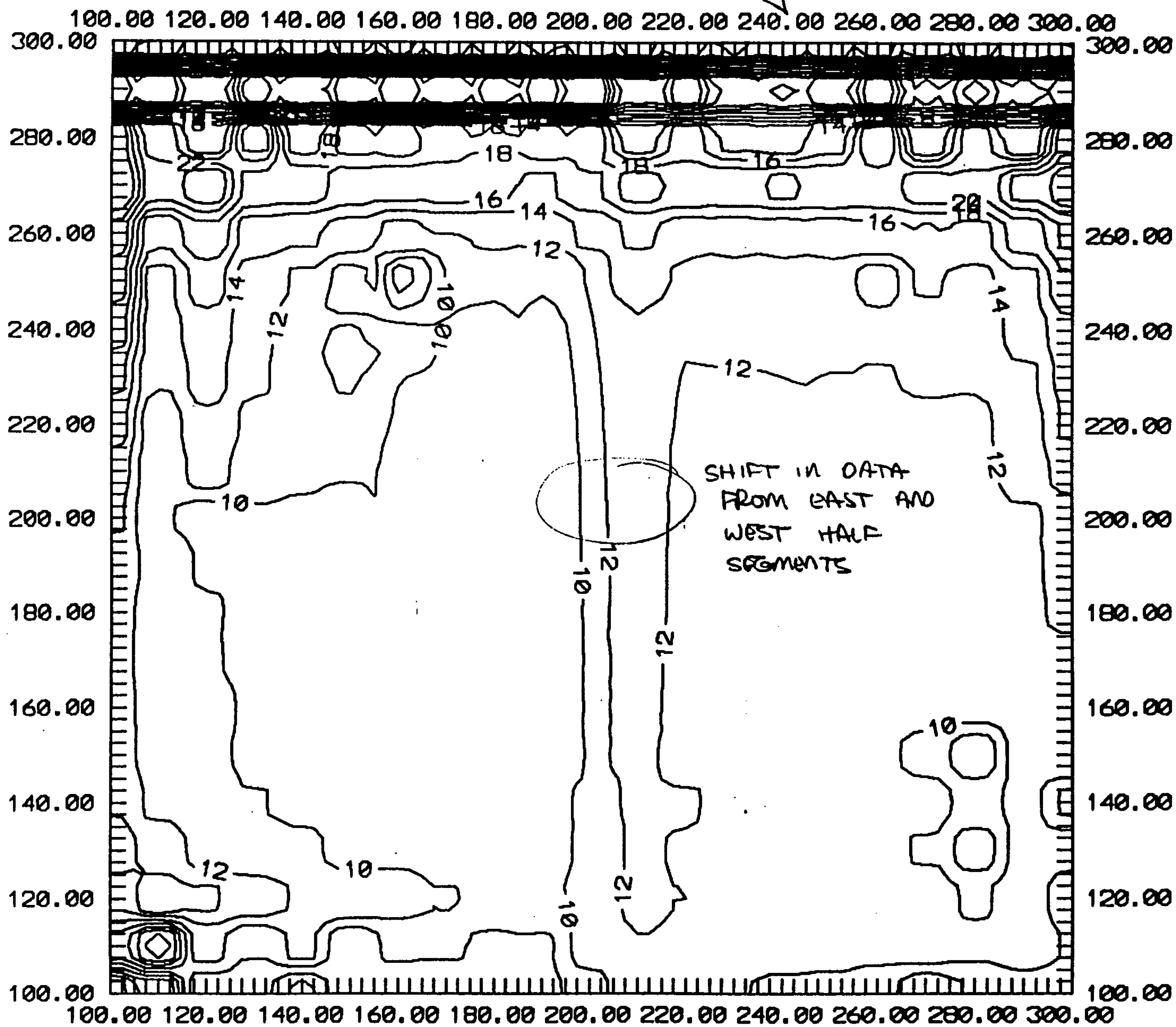
CI= 1 ppt

LIST 86 EM N-S Conductivity

86EM10

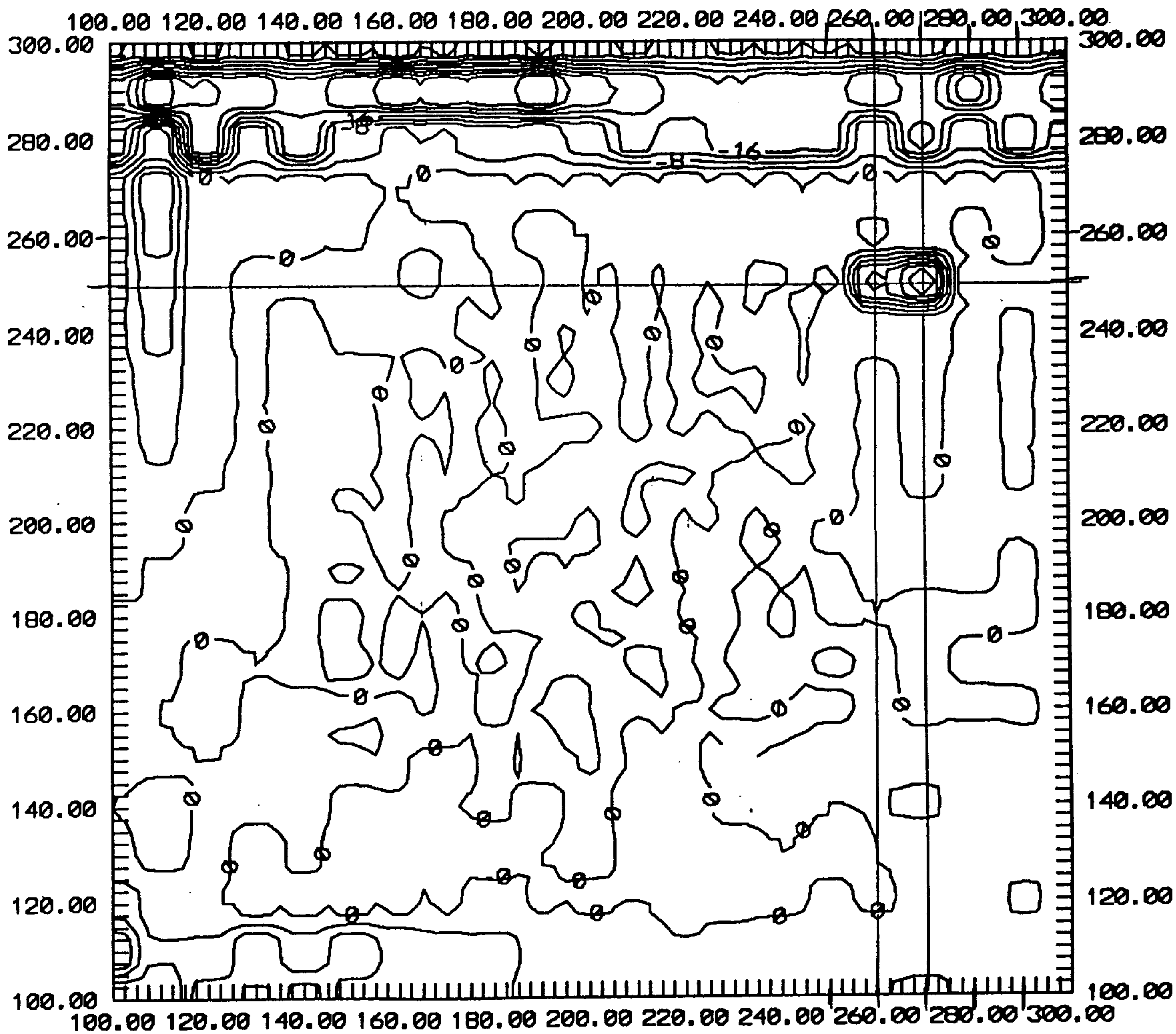
Orientation #1
(N-S)
OUT-OF-PHASE
(mmho/m)

CI=2 mmho/m



UST 86 EM Conductivity Difference

86EM-O



OUT-OF-PHASE DIFFERENCE (mmho/m)

CI=4 mmho/m

INTERPRETATION NOTES
USTs 88, 89 & 90

I. SITE MAP

- 300'x200' grid, 10' spacing
- No indication of USTs based upon surficial evidence.

II. MAGNETOMETER DATA

- Several anomalies are observed in the both magnetic data sets. None of these anomalies are considered geophysical targets because they are either associated with utilities or are not confirmed by EM data.

III. EM DATA

<u>In-Phase Data</u>

- No indication of targets.

<u>Conductivity Data</u>

- No indication of targets.

IV. CONCLUSIONS

- No geophysical targets that can't be attributed to cultural interference.

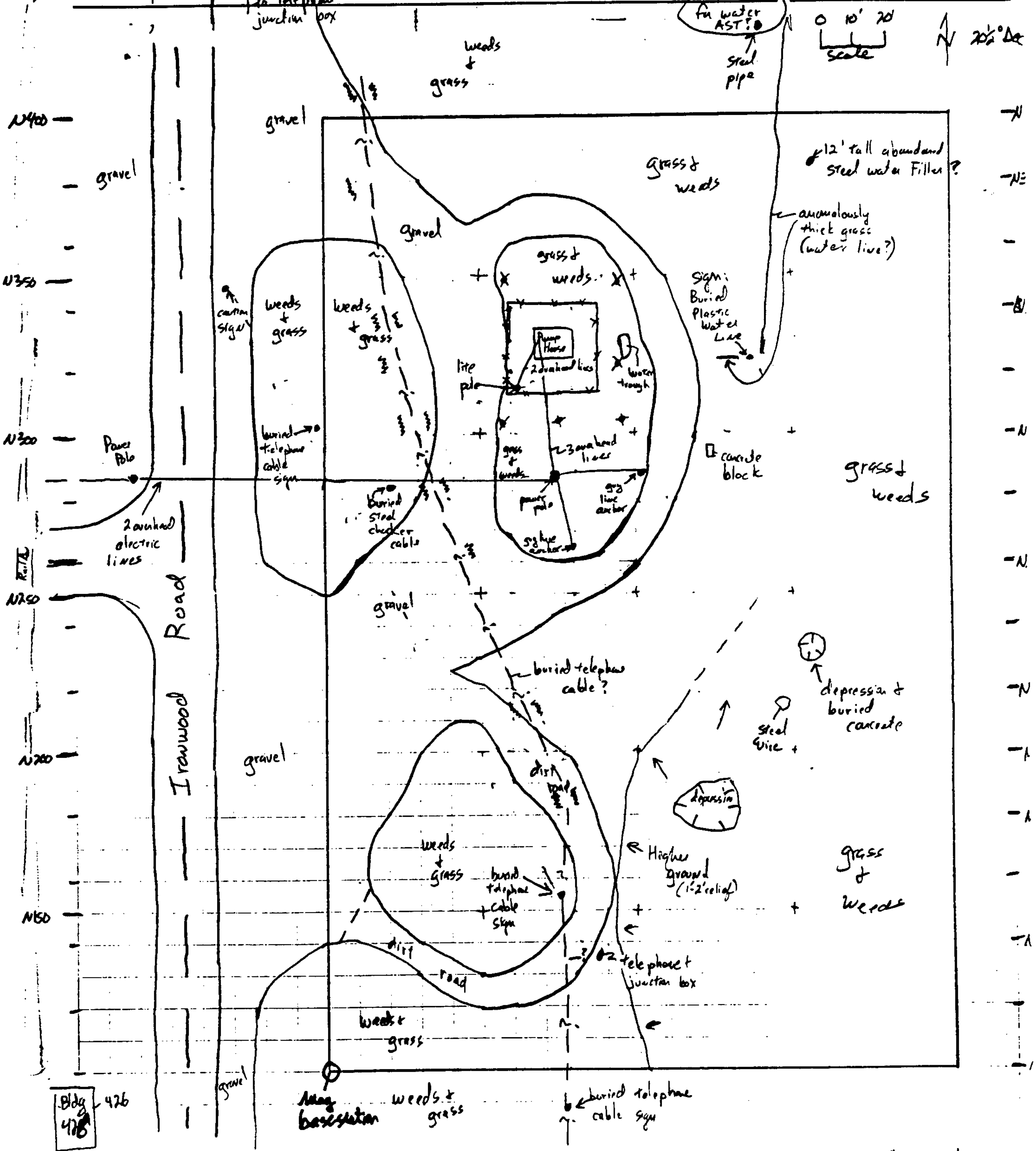
DAMES & MOORE

UST 88-90

Sheet No.
Calc. No.
Rev. No.
By Date
Chk'd. Date

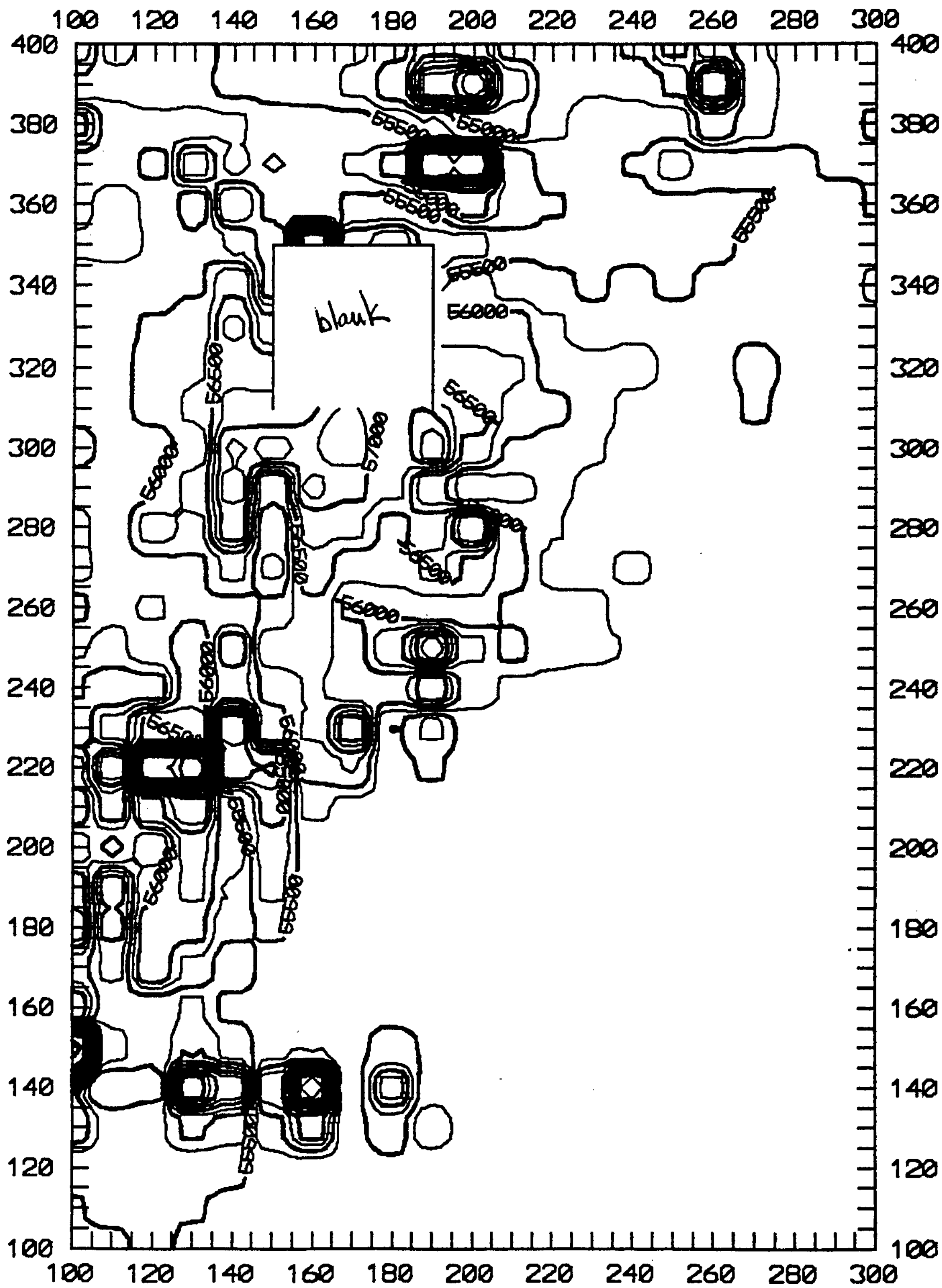
Note: ✦ : Steel Post
~ : marked buried, telephone(?) cable

Job No:
Job
Client
Subject



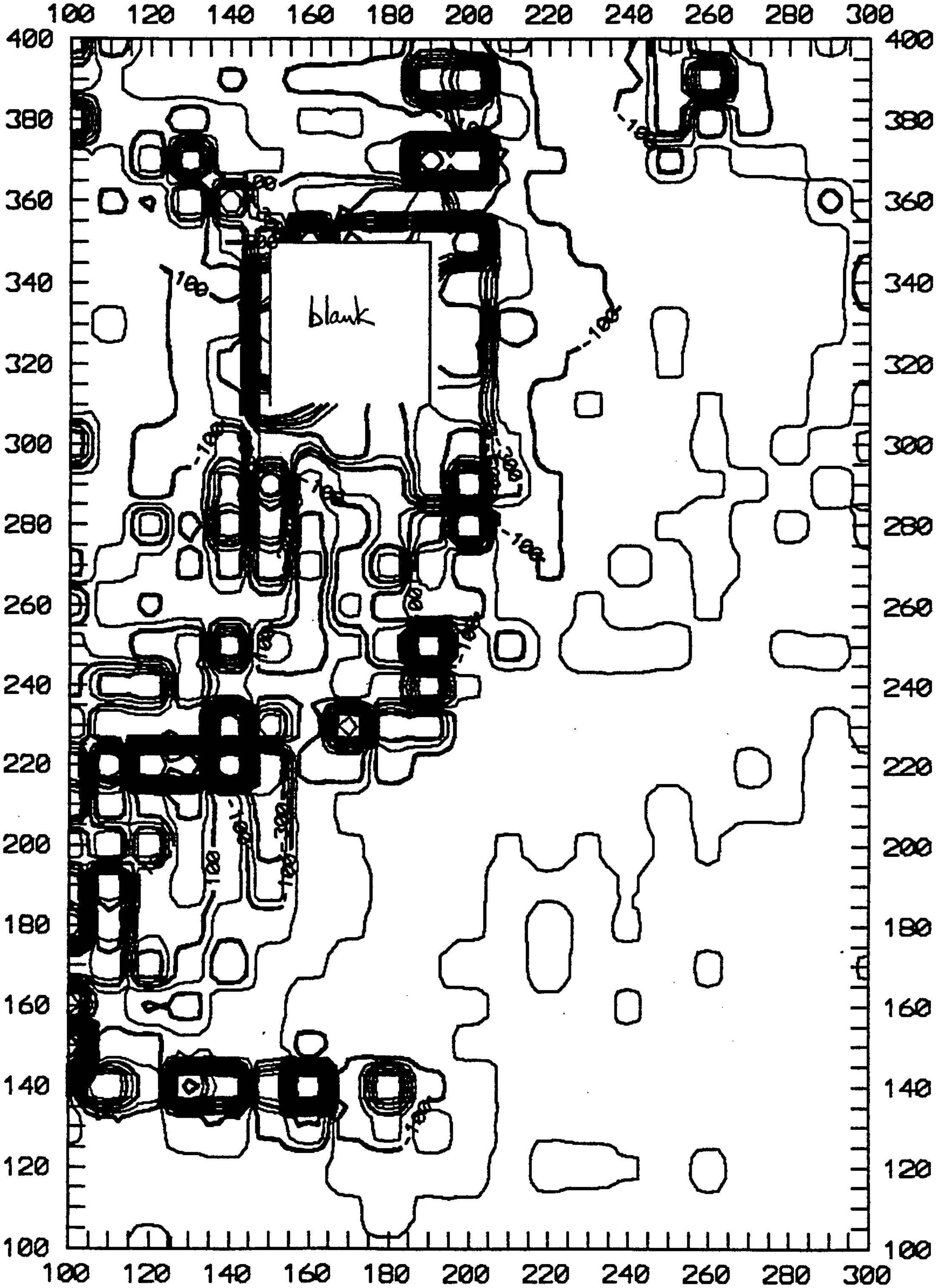
UST-IR
C-93

UST 88 Total Magnetic Field



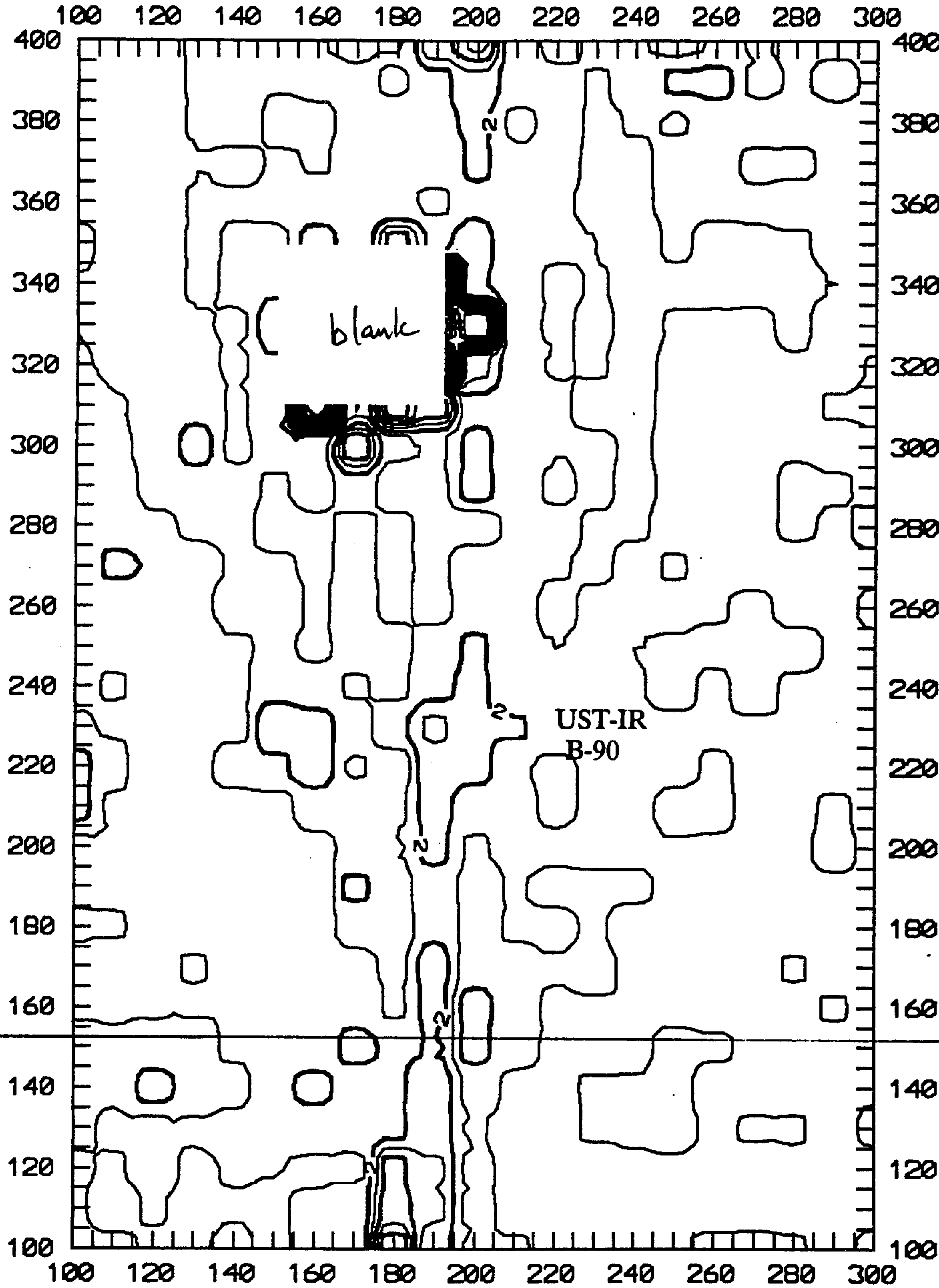
CI=250 8

UST 88 Vertical Magnetic Gradient



CI= 100Y

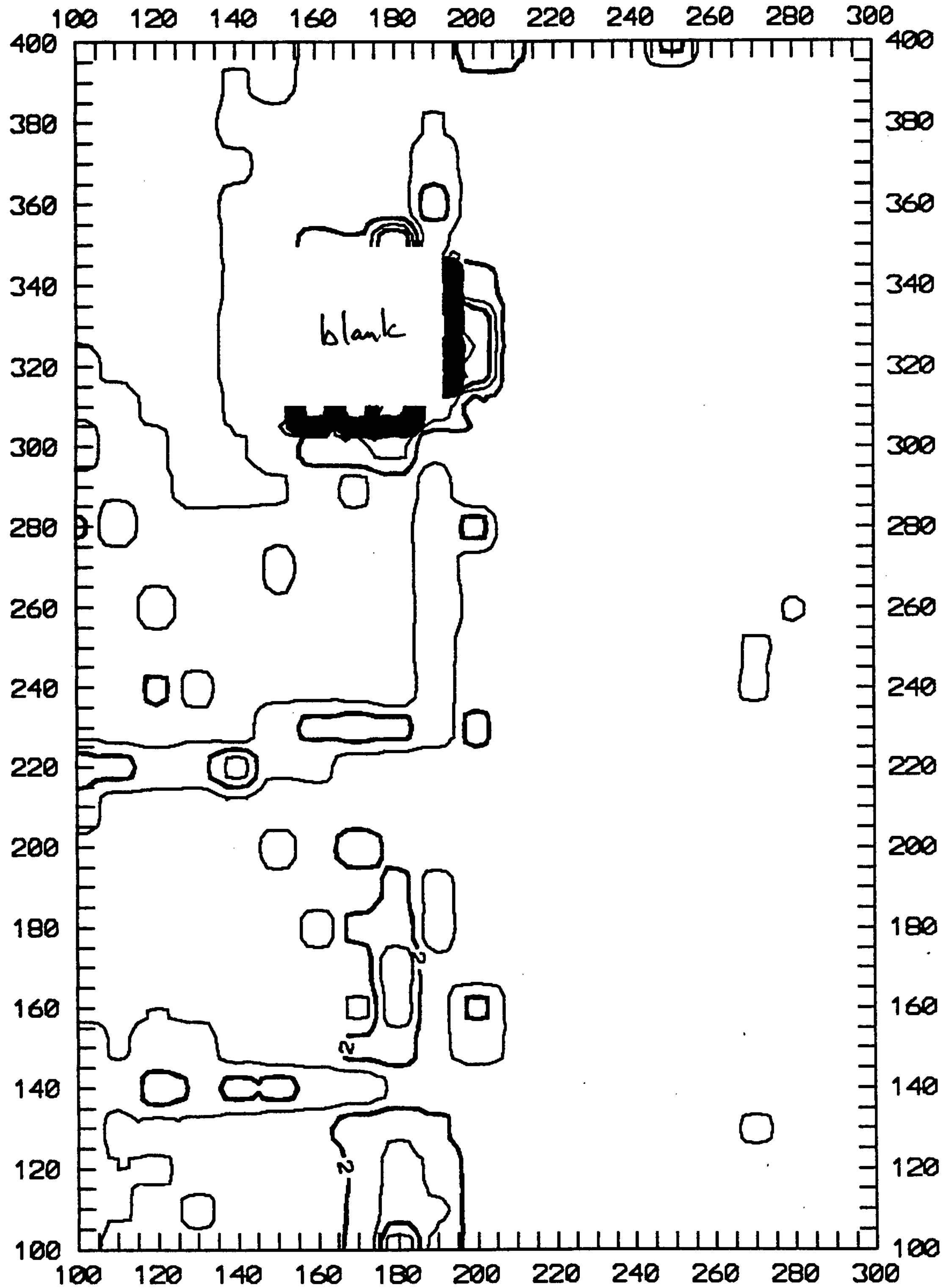
UST 88 EM In-Phase Difference



UST-IR
C-96

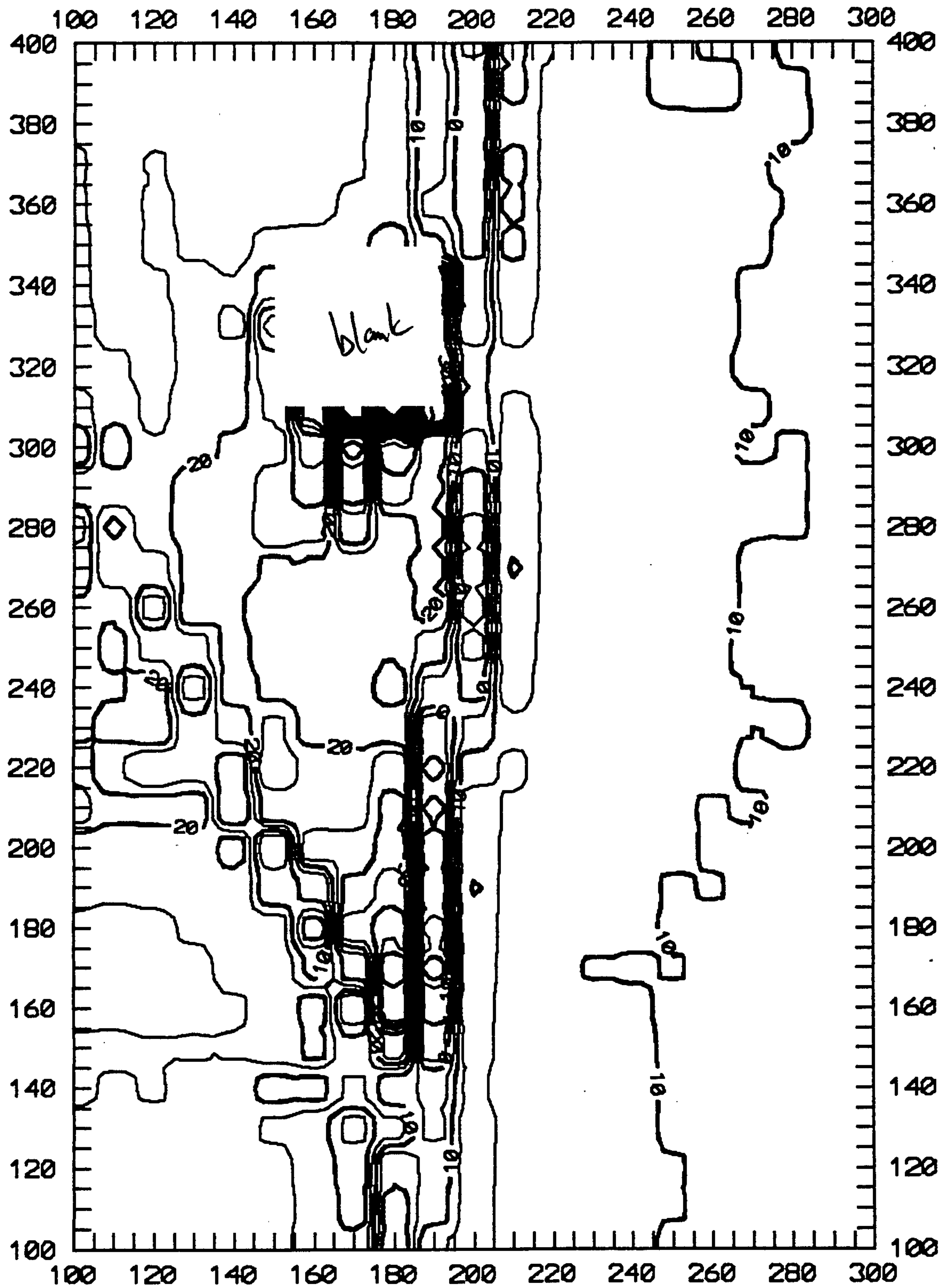
CI= 2 ppt

UST 88 EM N-S In-Phase Readings



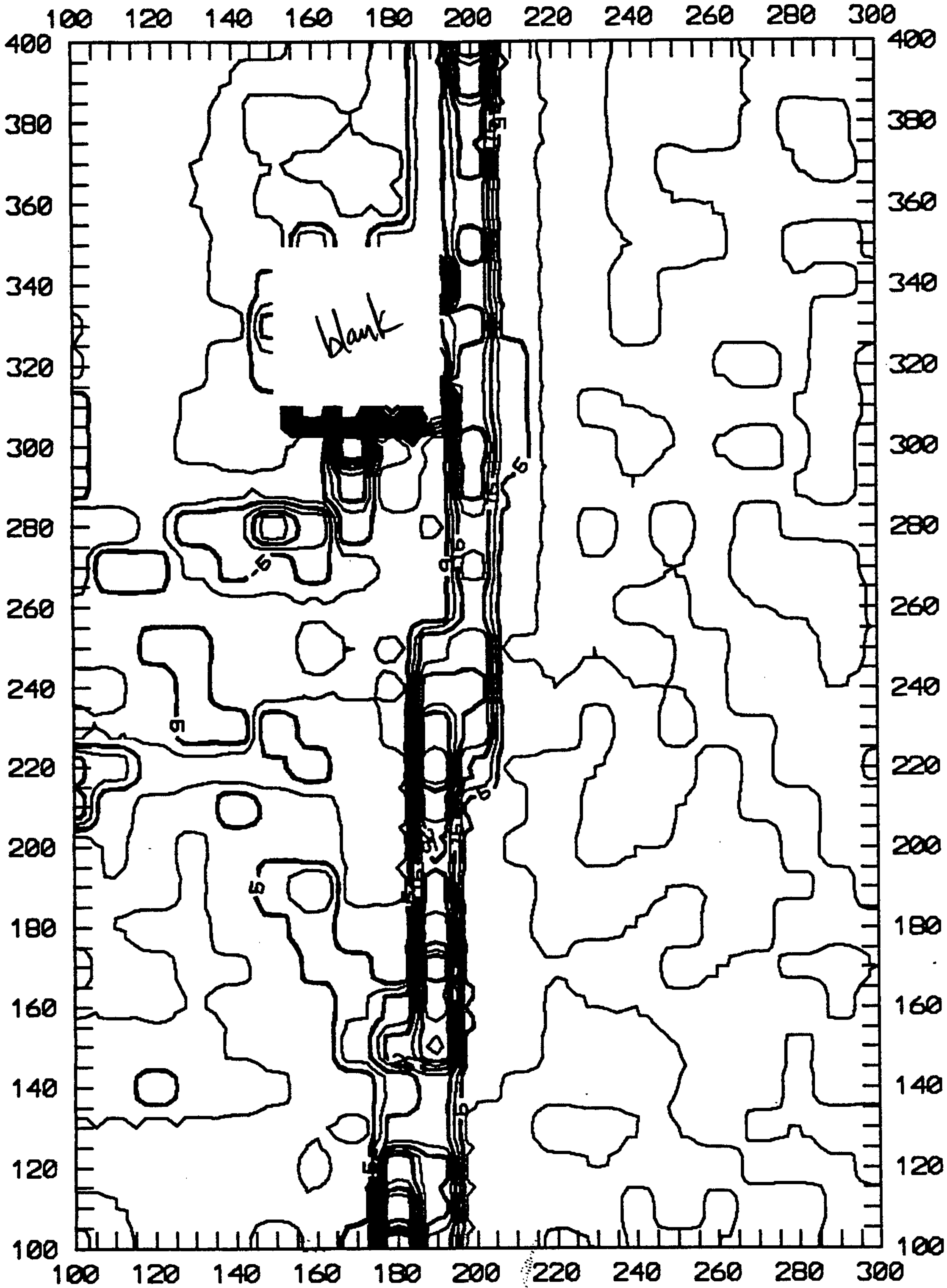
CI = 2 ppt

UST 88 EM N-S Conductivity



CI = 5 mmho/m

UST 88 EM Conductivity Difference



UST-IR

CI = 5 mmho/m

INTERPRETATION NOTES
UST 91

I. SITE MAP

- 200'x200' grid, 10'spacing

- No indication of USTs based upon surficial evidence.

II. MAGNETOMETER DATA

- Several small, weak anomalies are observed in the Total Magnetic Field map. However, none of these anomalies are confirmed by EM data, and are therefore not considered geophysical targets.

- The vertical magnetic gradient data set appears to have crashed and needs reprocessing.

III. EM DATA

<u>In-Phase Data</u>

- No indication of targets.

<u>Conductivity Data</u>

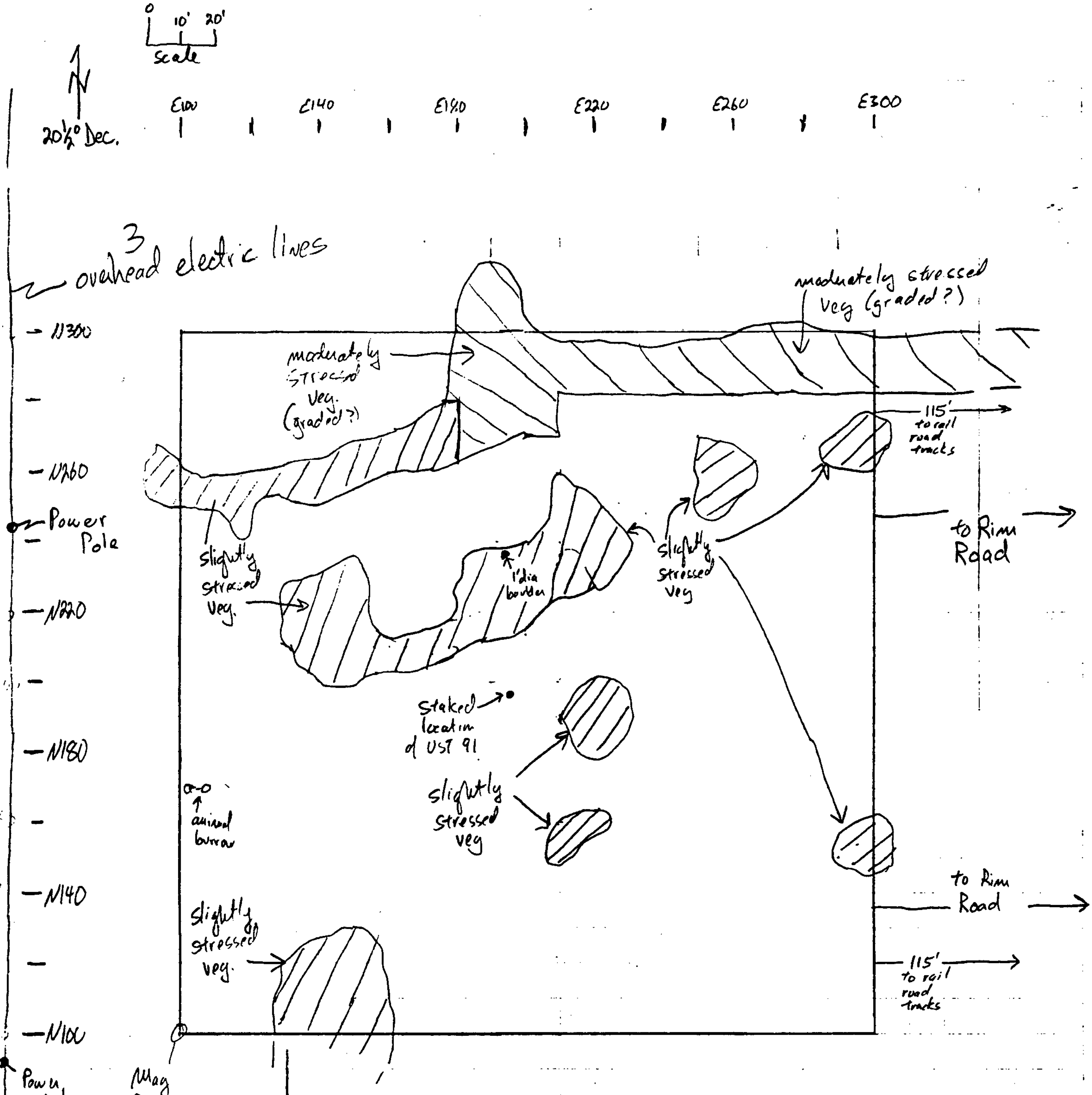
- No indication of targets.

IV. CONCLUSIONS

- No geophysical targets that can't be attributed to cultural interference.

DAMES & MOORE

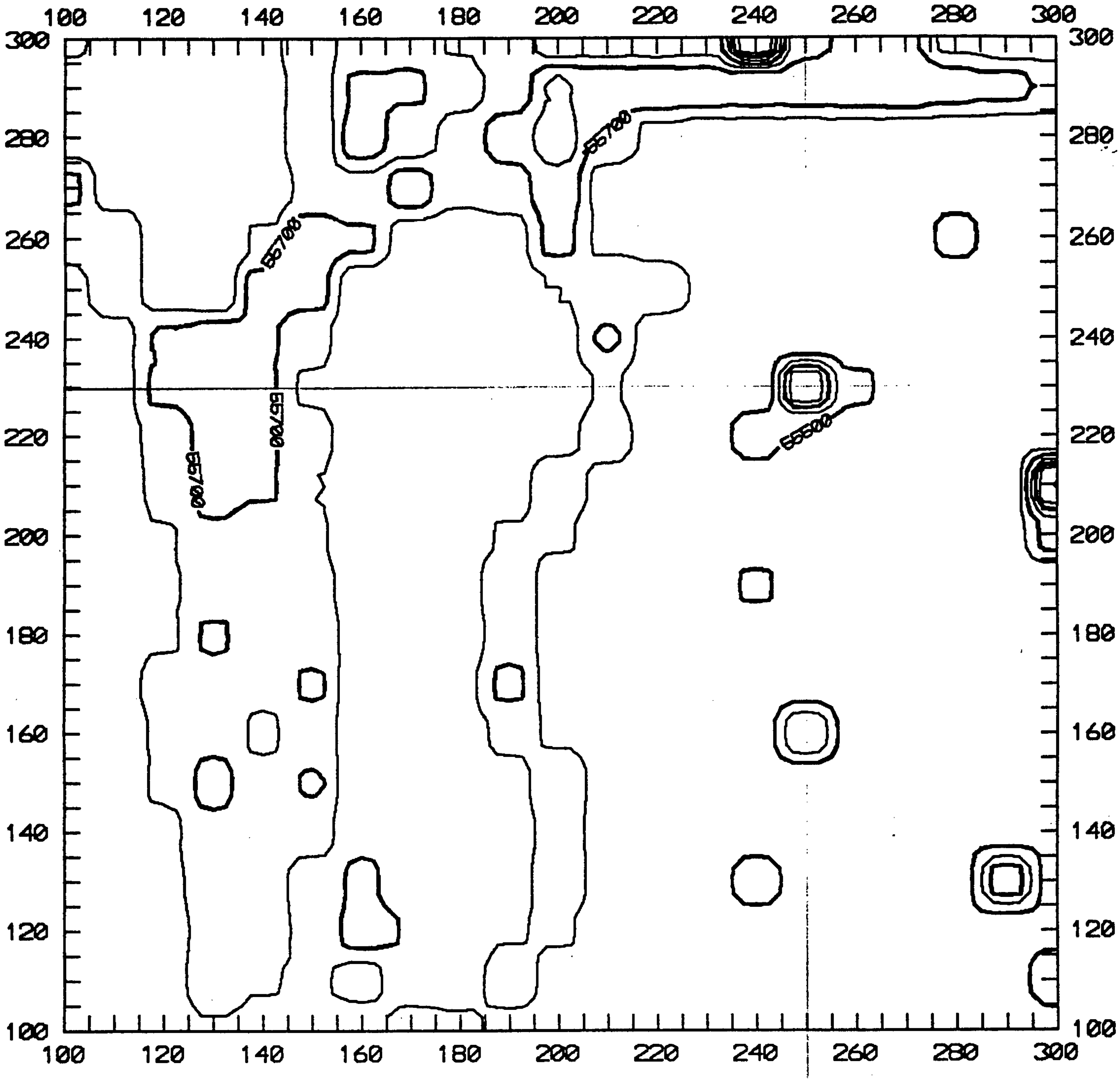
Job No.	Job UST 91	Sheet No.
Client	Subject	Calc. No.
		Rev. No.
		By JMA Date 9/26/92
		Chk'd. Date



Note: Staked location of UST 91 is
- 30' South of center line of A Road
- 220' West of center of rail road track
- 760' North of center of Center Road

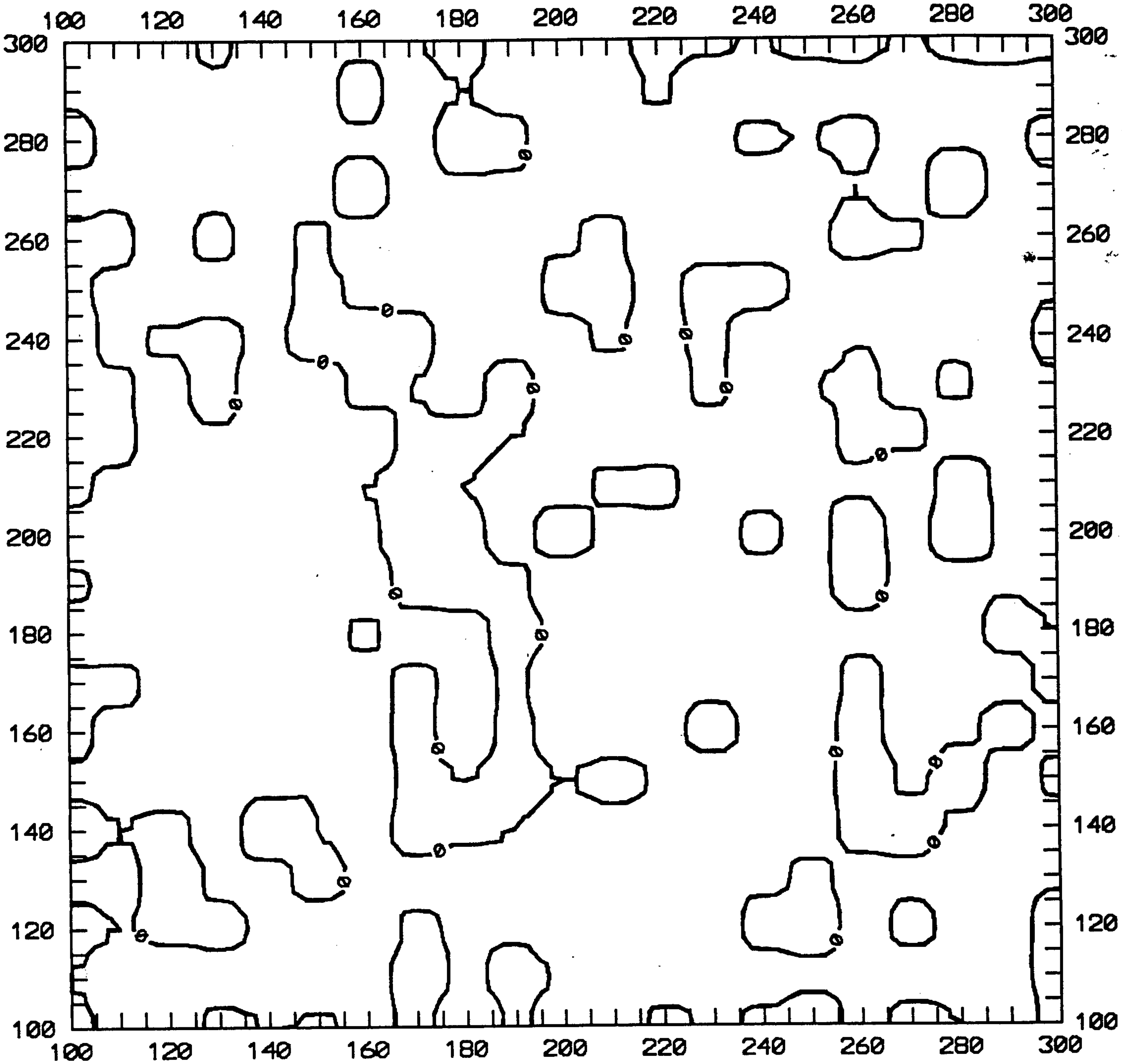
UST-IR
C-101

UST 91 Total Magnetic Field



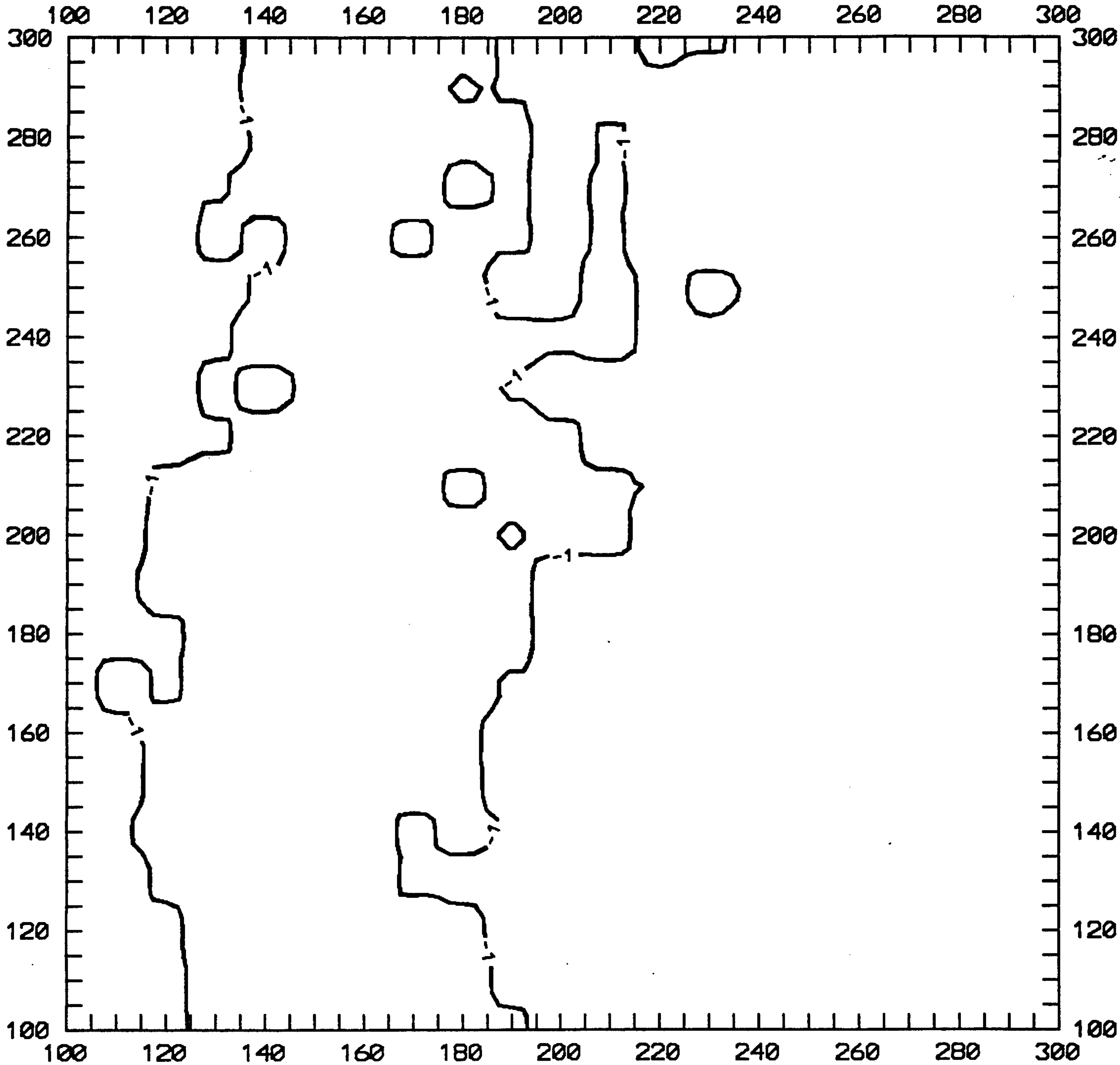
CI = 100 δ

UST 91 EM In-Phase Difference



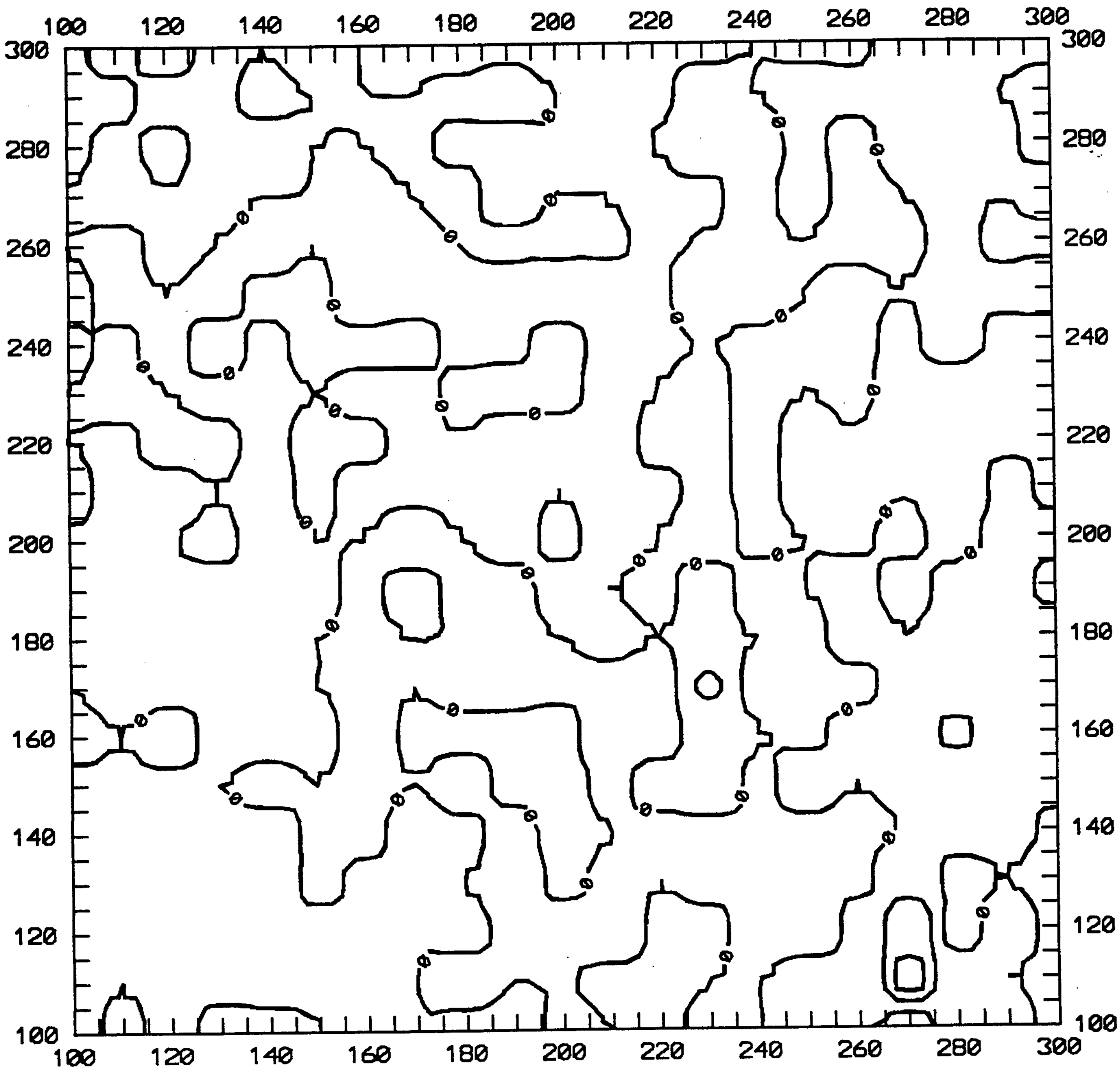
CI = 1 ppt

UST 91 EM N-S In-Phase Readings



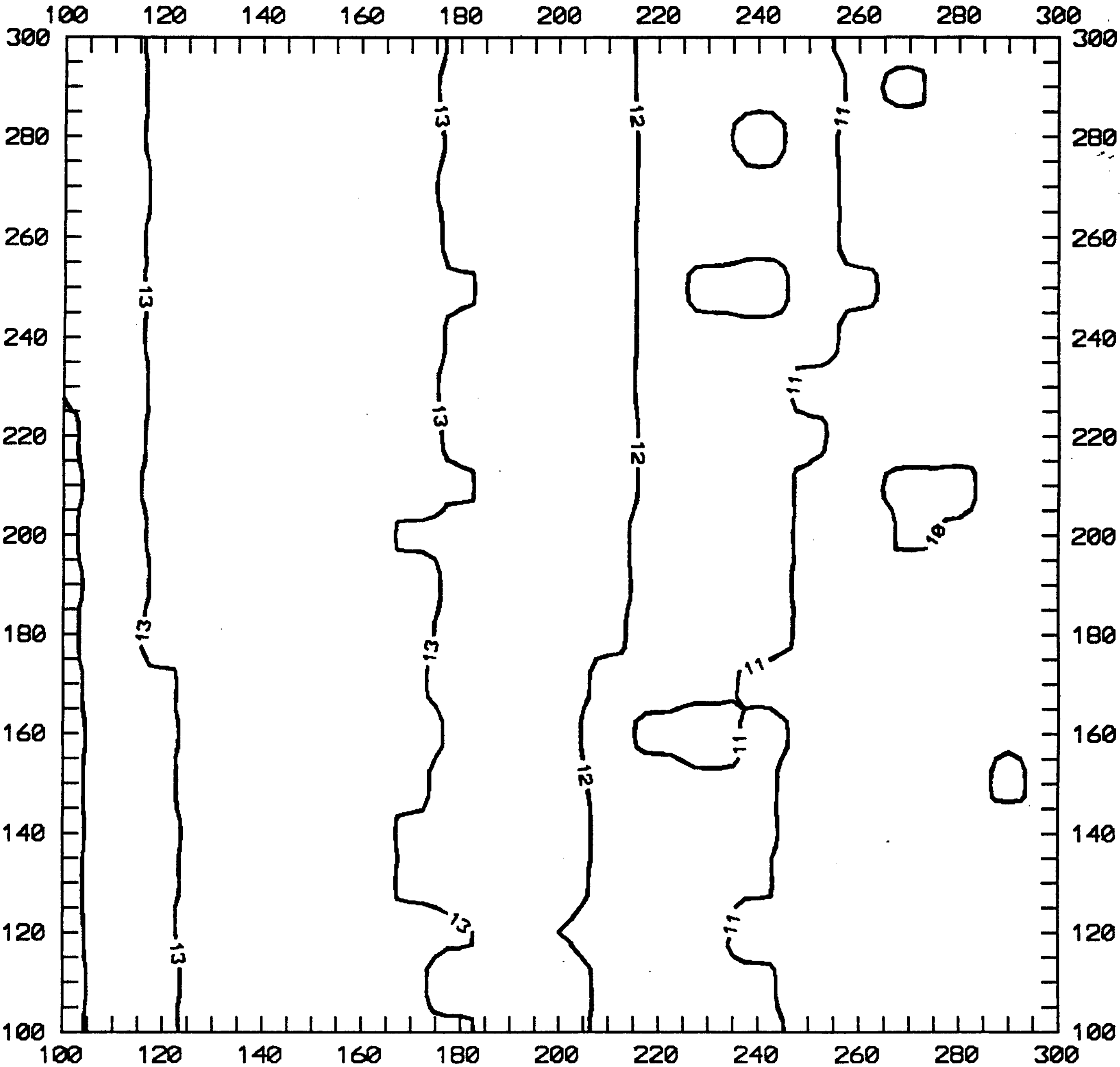
CI = 1 ppt

UST 91 EM Conductivity Difference



CI = 1 mmho/m

UST 91 EM N-S Conductivity



CI = 1 mmho/m

INTERPRETATION NOTES
UST 99

I. SITE MAP

- 100'x95' grid, 5' spacing
- No indication of USTs based upon surficial evidence.
- The site contained a good deal of cultural interference due to utilities and buildings.
- The Work Plan described the subject tank as being located between the two warehouses presented in the site map. A reconnaissance of the warehouse area suggested that a tank may never have been located in the subject site. Rather, a large (>10,000 gallon), currently existing UST may have supplied heating oil for 6 adjacent warehouses. This conclusion was based upon the proximity and symmetry of the warehouses.

II. MAGNETOMETER DATA

- Both the vertical magnetic gradient and the total magnetic field data need to be reprocessed.

III. EM DATA

<u>In-Phase Data</u>

- No indication of targets.

<u>Conductivity Data</u>

- No indication of targets.

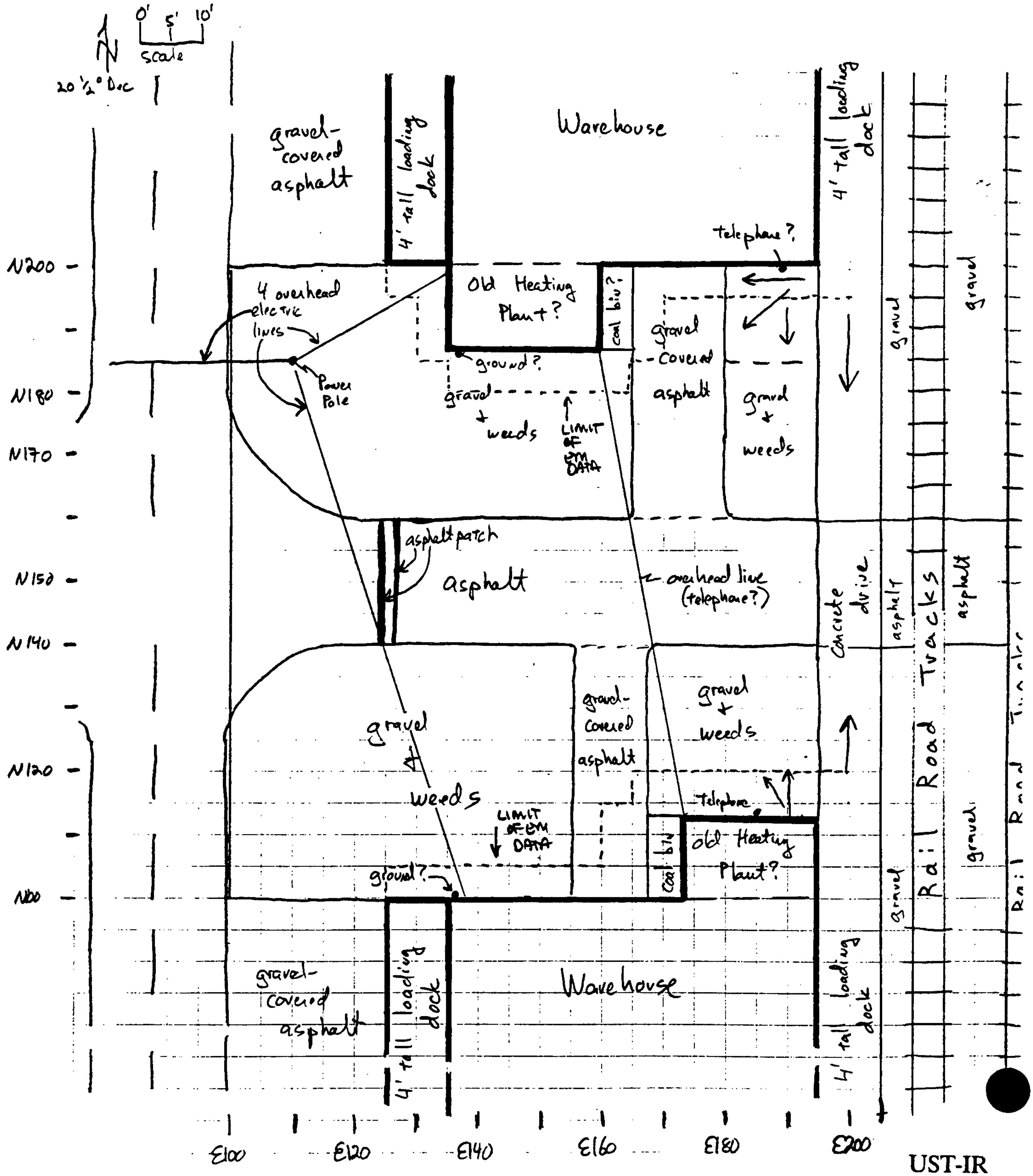
IV. CONCLUSIONS

- Although the magnetic data need to be reprocessed, no geophysical targets were identified that can't be attributed to cultural interference.

DAMES & MOORE

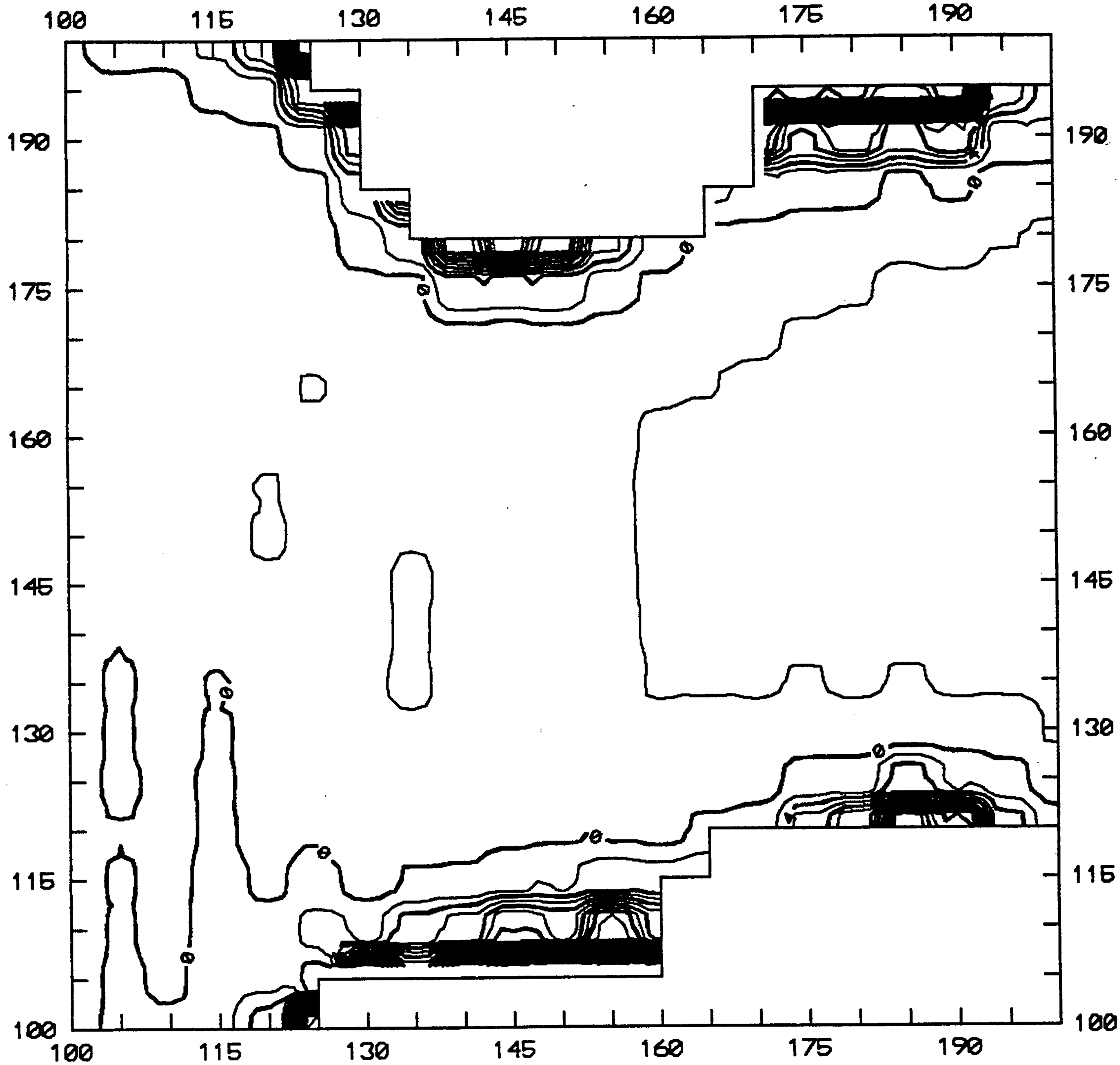
UST 99

Job No.	Job	Sheet No.	
		Calc. No.	
		Rev. No.	
		By JMA	Date 9/26/92
Client	Subject	Chk'd.	Date



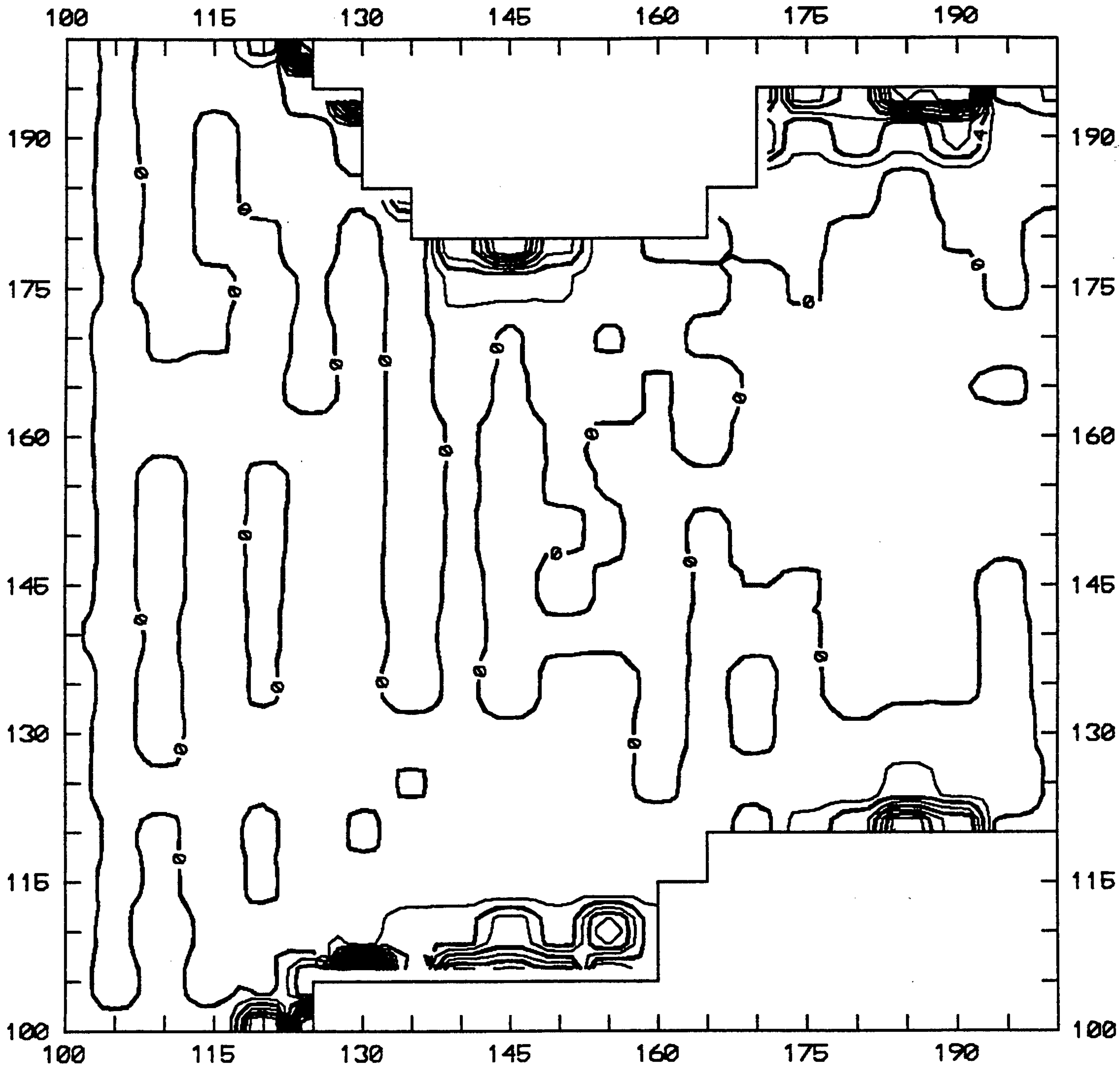
UST-IR
C-108

UST 99 EM N-S In-Phase Readings



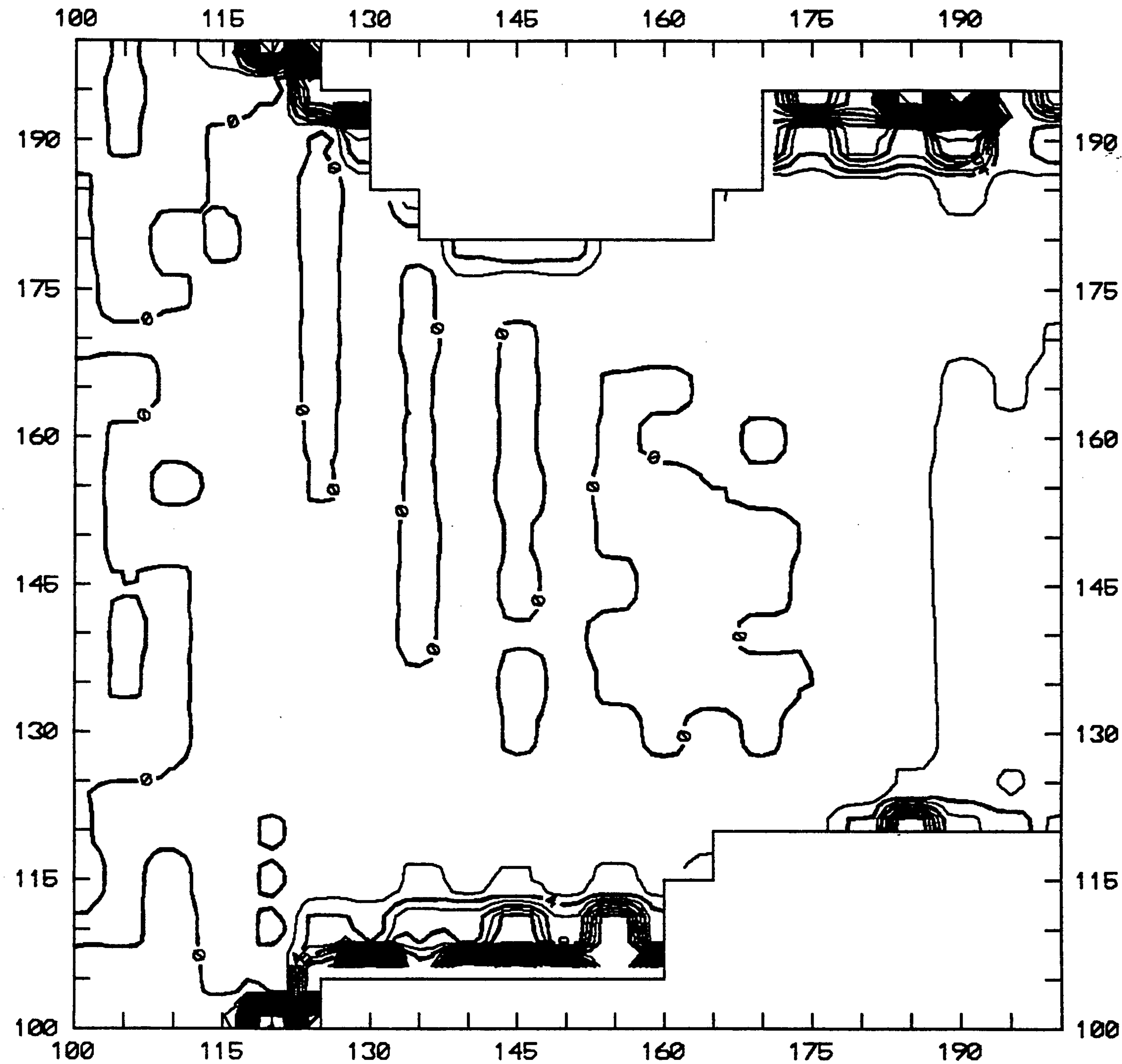
CI= 2ppt

UST 99 EM In-Phase Difference



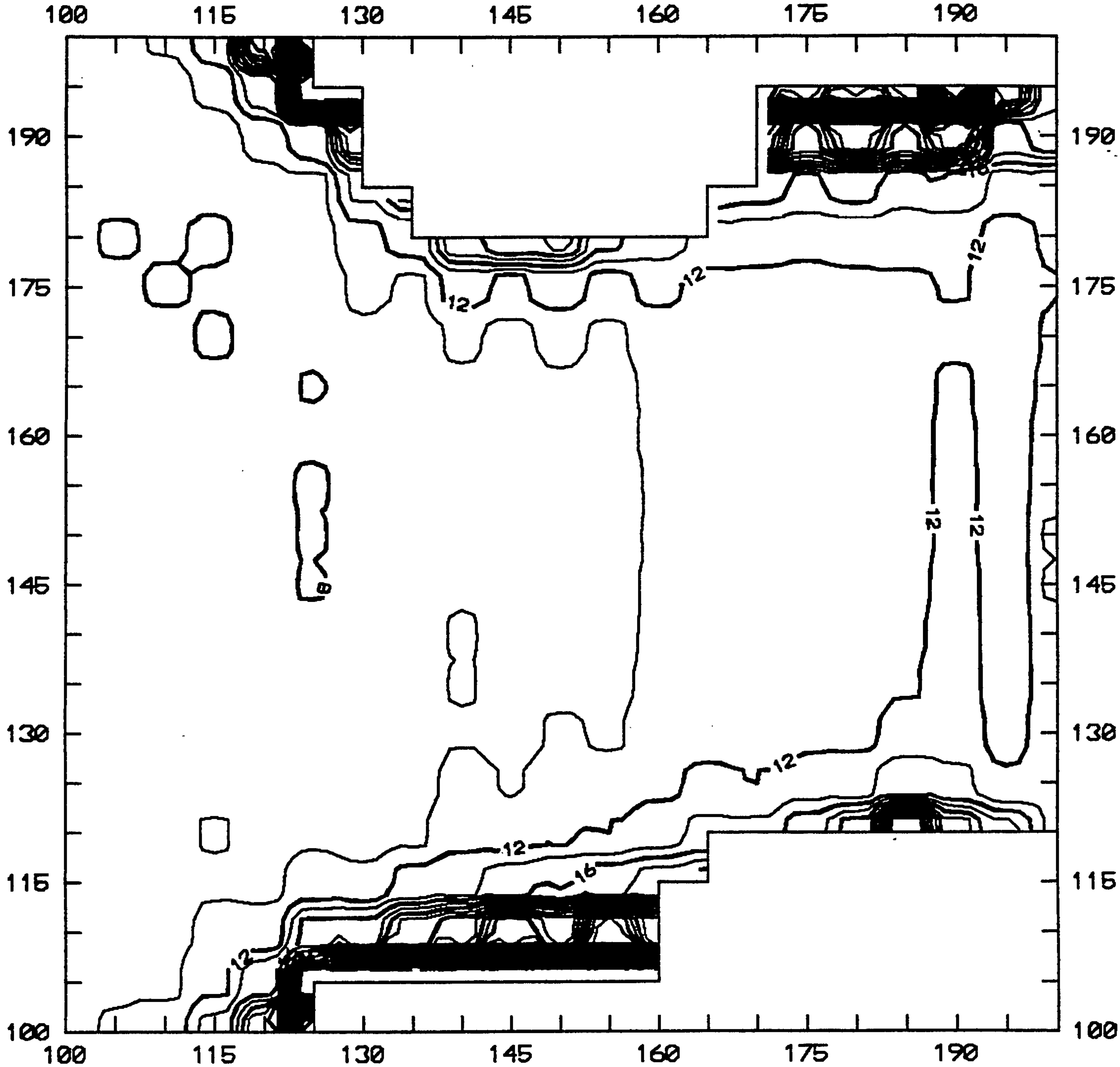
CI = 2 ppt

UST 99 EM Conductivity Difference



CI = 2 mmho/m

UST 99 EM N-S Conductivity



CI=2 mmho/m

INTERPRETATION NOTES
UST 102

I. SITE MAP

- 80'x95' grid, 5' spacing

- Little indication of USTs based upon surficial evidence.

    - Concrete vault (?) located N170/E135.

- Rail road tracks occur along the northern border of the survey grid.

II. MAGNETOMETER DATA

- Several anomalies occur in both the vertical magnetic gradient and the total magnetic field data sets. Only one of these anomalies are considered to be a geophysical target. That target is located N155-175/E120-135. The other anomalies are not considered targets because they can be either associated with cultural interference or because they are not confirmed by EM data.

III. EM DATA

<u>In-Phase Data</u>

- One large, strong geophysical target is observed occurring N155-175/E115-135. This anomaly is the strongest target observed in the field program.

  The N-S In-Phase Readings map suggests that two separate targets may exist side-by-side.

<u>Conductivity Data</u>

- One large, strong geophysical target is observed occurring N155-175/E115-135. This anomaly is the strongest target observed in the field program.

IV. CONCLUSIONS

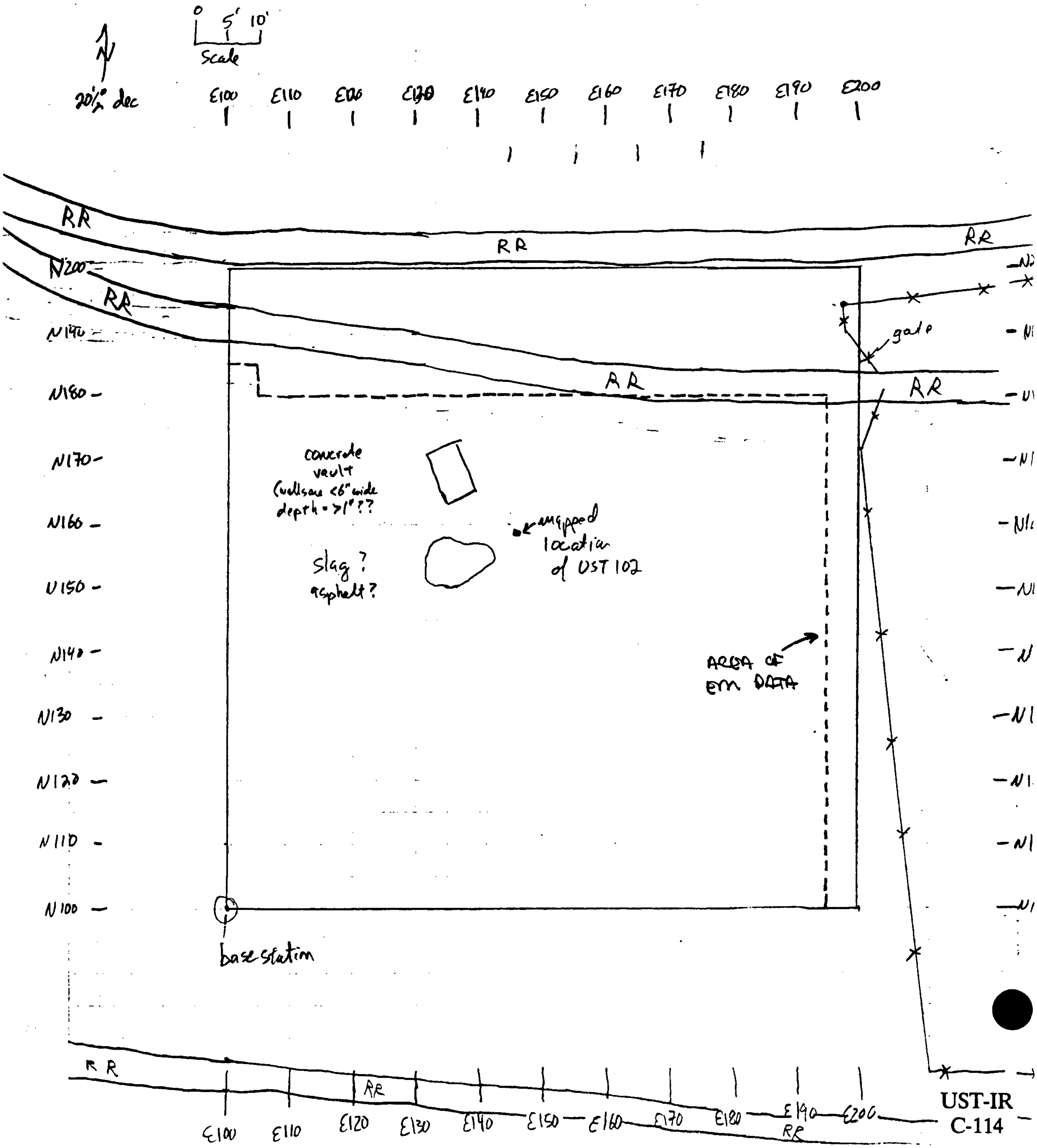
- One large, strong geophysical target was observed in both the magnetic and EM data. The target is located approximately N155-175/E115-135.

- The target may be composed of 2 side-by-side targets.

DAMES & MOORE

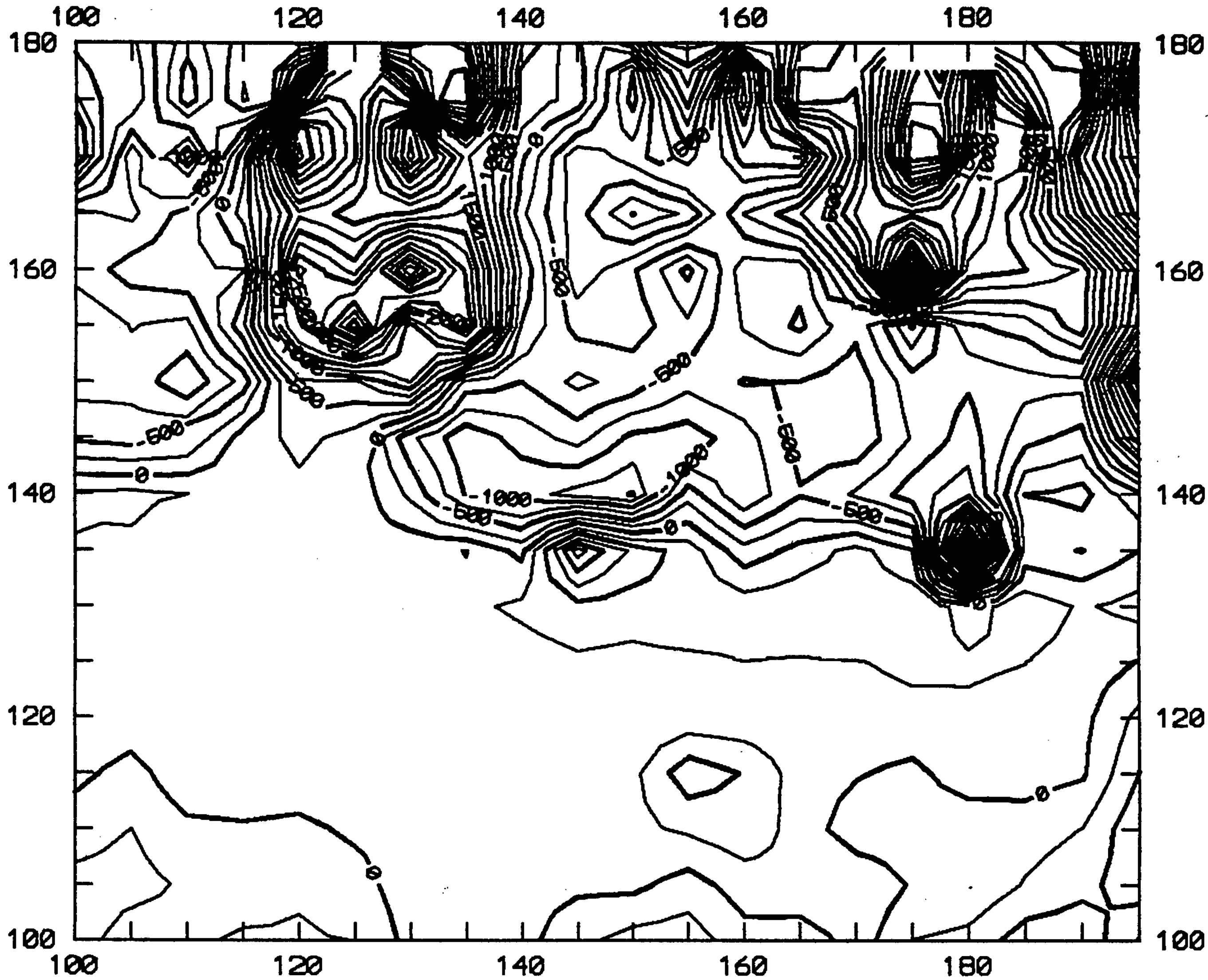
Sheet No.
Calc. No.
Rev. No.

Job No.	Job UST 102	By	Date 9/12/
Client	Subject	Chk'd.	Date



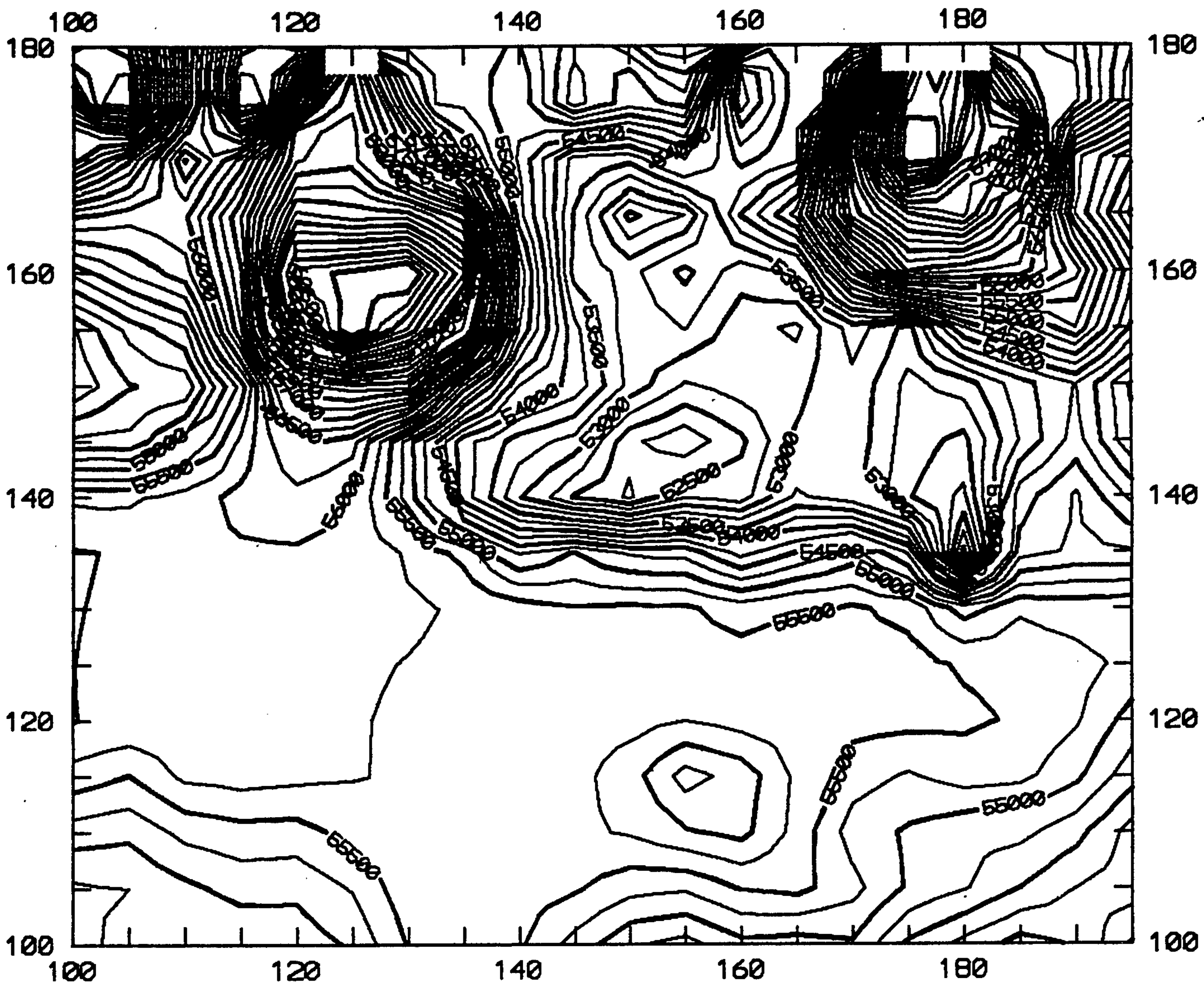
UST-IR
C-114

UST 102 Vertical Magnetic Gradient



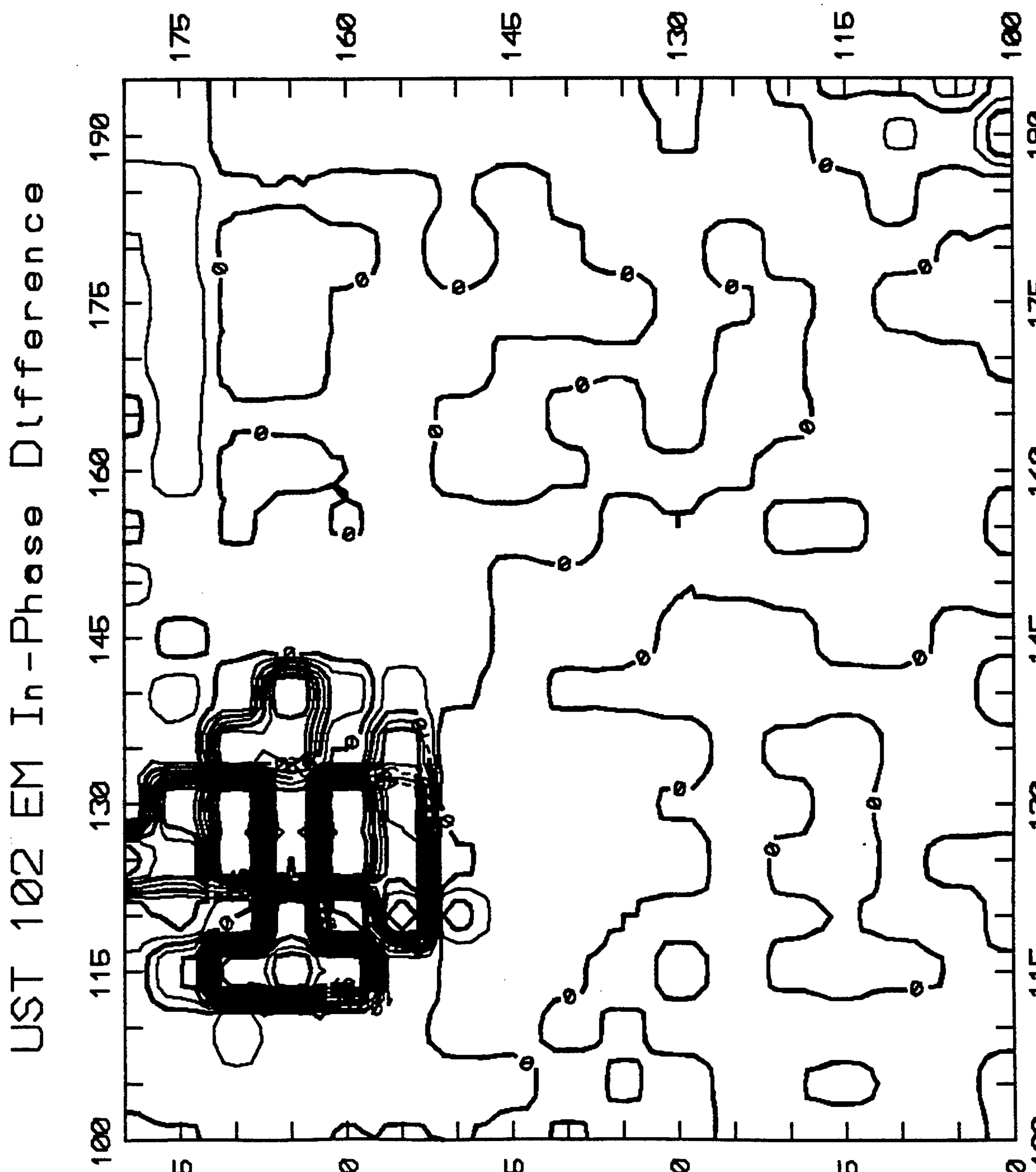
CI=250 γ

UST 102 Total Magnetic Field

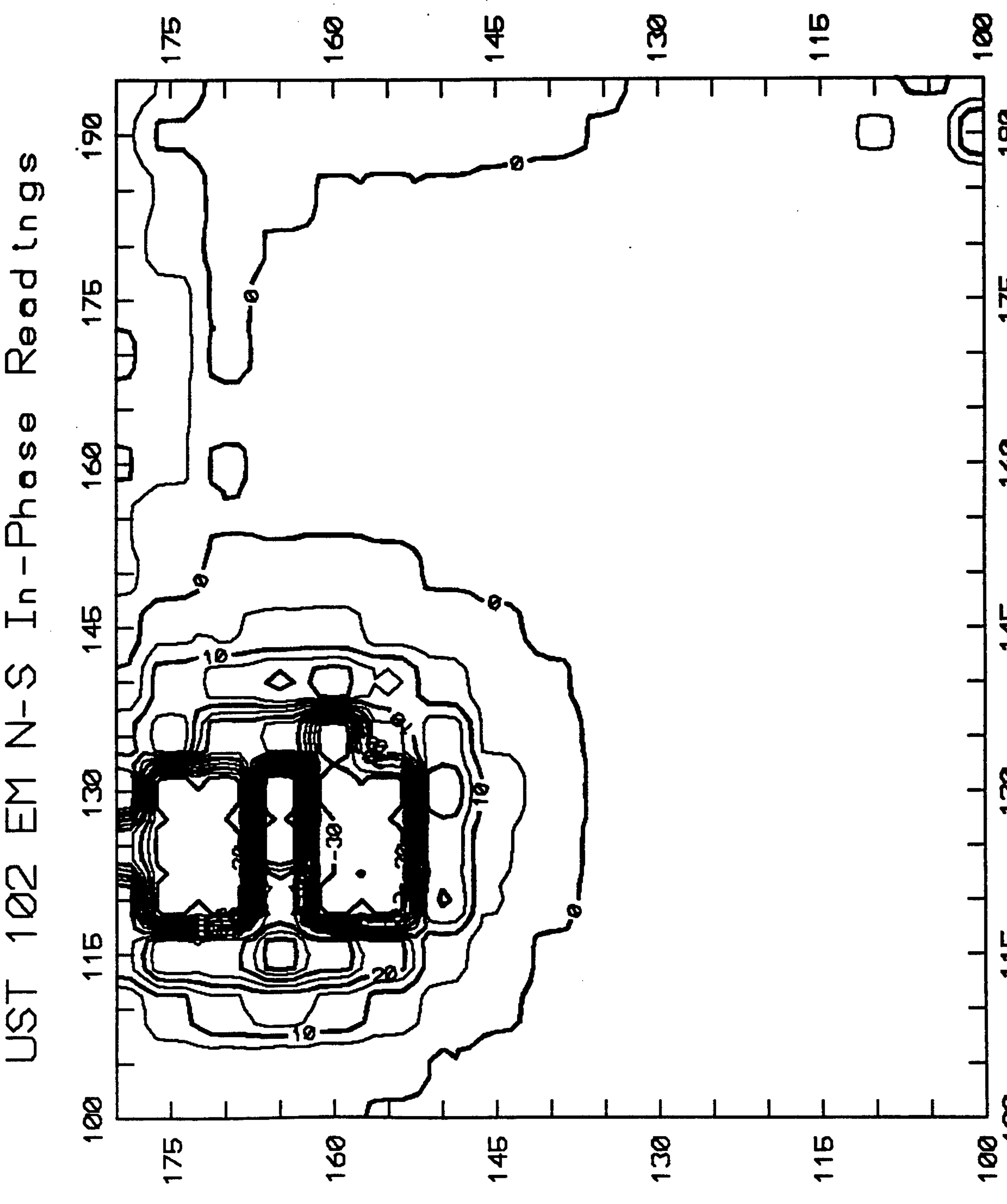


CI= 250γ

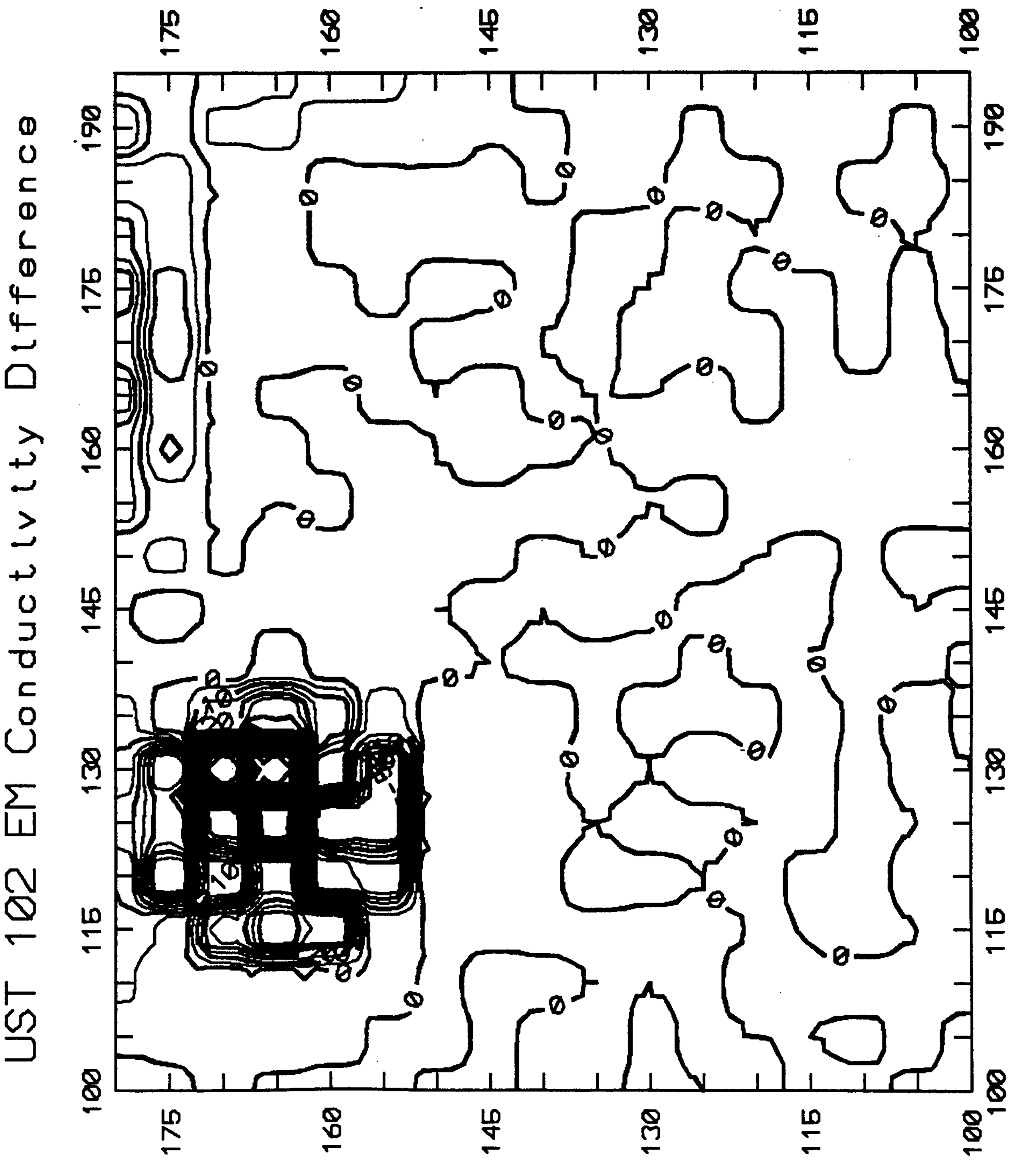
CI = 5 ppt

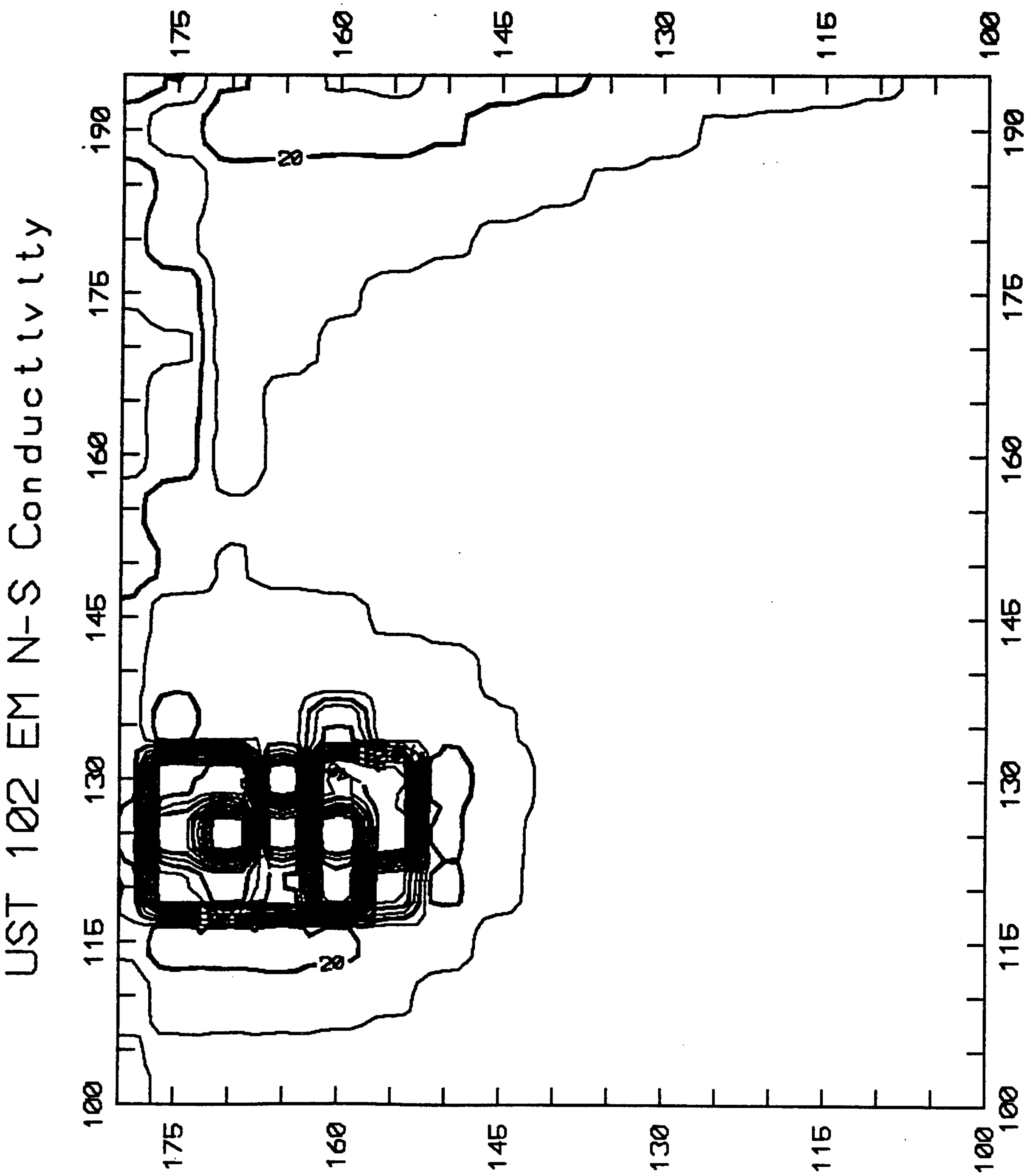


C-5 mmho/m


UST 102 EM N-S In-Phase Readings
100
115
130
145
160
175
190
0
10
20
-30

CI = 5 mmho/m




UST 102 EM N-S Conductivity
100
115
130
145
160
175
190
20

APPENDIX D

Tracer Research Corporation
Active Soil Gas Survey Report

Tracer Research Corporation

Shallow Soil Gas Investigation

UMATILLA DEPOT ACTIVITY
Hermiston, Oregon

September 23 to November 11, 1992
Revised-January 1993

Prepared for:

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1-92-763-S

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TABLES

1.0 UMATILLA DEPOT ACTIVITY INVESTIGATION

Tracer Research Corporation (Tracer Research) performed shallow soil gas investigations at twenty sites within the Umatilla Depot Activity (UMDA) in Hermiston, Oregon. The investigations were conducted September 23 through November 11, 1992 for Dames & Moore of Linthicum, Maryland in support of the U.S. Army Toxic and Hazardous Materials Agency's (USATHAMA) underground storage tank (UST) program conducted as part of the Installation Restoration Program.

1.1 Objective

The purpose of the investigation was to delineate the extent of possible soil and/or groundwater contamination at each site by screening shallow soil gas for the presence of volatile organic chemicals (VOCs) and fixed gases. Soil gas samples were collected and analyzed for the following suite of compounds:

carbon dioxide (CO_2)
methane (CH_4)
benzene, toluene, ethylbenzene, and xylenes (BTEX)
total volatile hydrocarbons (TVHC)

1.2 Overview of Results

For this investigation, 454 soil gas samples were collected from 455 sampling locations at a depth of 3 feet below ground surface (bgs). Sample collection was not attempted at location SG-41 due to the presence of underground utilities in the subsurface. Soil gas samples collected from sampling locations SG-60, SG-61, and SG-62 were not analyzed for CO_2 and CH_4 due to analytical difficulties that were corrected before sampling began the next morning.

2.0 SITE DESCRIPTION

The UMDA is an ordnance facility established by the U.S. Army to store conventional and chemical munitions. Previously, other functions of UMDA included ammunition demolition, renovation, and maintenance. The UMDA is located in the high plains near the border of Oregon and Washington. There is a main area of buildings along with various chemical storage facilities. The soil gas investigation

sites were miles apart throughout the depot. The soil gas samples were collected beneath dirt, gravel, grass, and asphalt coverings. The depth to groundwater is approximately 100 feet bgs and flows to the northwest.

3.0 SAMPLING PARAMETERS

Soil gas sampling probes consisted of 7-foot lengths of 3/4-inch diameter hollow steel pipe. The probes were fitted with detachable drive tips and pushed and/or pounded to a depth of approximately 3 feet below ground surface (bgs). Some of the probes were hand pounded into the ground. An electric roto hammer was used to drill through the asphalt covering.

The aboveground end of each probe was fitted with an aluminum reducer (manifold) and a length of polyethylene tubing leading to a vacuum pump. Soil gas was pulled by the vacuum pump into the probe. Samples were collected in a glass syringe by inserting a syringe needle through a silicone rubber segment in the evacuation line and down into the steel probe. The vacuum was monitored by a vacuum gauge to ensure an adequate gas flow from the vadose zone was maintained.

The volume of air within the probe was purged by evacuating 2 to 5 probe volumes of gas. The evacuation time in minutes versus the vacuum in inches of mercury (Hg) was used to calculate the necessary evacuation time. The vacuum in inches Hg was recorded at each sampling location.

Sample probe vacuums ranged from 2 to 10 inches Hg. The vacuum capacity of the pump was approximately 24 inches Hg.

4.0 ANALYTICAL PARAMETERS

During this investigation, up to 10 milliliters (mL) of soil gas were collected for each sample and immediately analyzed in the Tracer Research analytical van. Subsamples (replicates) from these samples were injected into the gas chromatograph (GC) in volumes of 100 to 1000 microliters (uL).

Analytical instruments were calibrated daily using fresh working standards made from National Institute of Sciences and Technology (NIST) traceable standards and reagent blanked solvents.

4.1 Analyte Class

The soil gas samples were analyzed for the following analyte classes and compounds:

Analyte Class: Fixed Gas
CO_2
CH_4

Analyte Class: Hydrocarbon
BTEX
TVHC

4.2 Chromatographic System

A Hewlett Packard 5890 Series II gas chromatograph, equipped with a flame ionization detector (FID), a thermal conductivity detector (TCD), and two computing integrators, was used for the soil gas analyses. The fixed gases were separated in the GC on a 6 foot by 1/8 inch outer diameter (OD) packed analytical column (10% OV101 stationary phase bonded to 80/100 mesh Chromosorb W support) and detected on the TCD. The hydrocarbon compounds were separated in the GC on a 10 foot CTRI column and detected on the FID. Both columns were in a temperature controlled oven. Nitrogen and hydrogen were used as the carrier gases.

The instrument calibrations were checked periodically throughout the day to monitor the response factor and retention time. The following paragraphs explain the GC, FID, and TCD processes.

GC Process

The soil gas vapor is injected into the GC where it is swept through the analytical column by the carrier gas. The detector senses the presence of a component different from the carrier gas and converts that information to an electrical signal. The components of the sample pass through the column at different rates, according to their individual properties, and are detected by the detector. Compounds are identified by the time it takes them to pass through the column (retention time).

FID Process

The FID utilizes a flame produced by the combustion of hydrogen and air. When a component, which has been separated on the GC analytical column, is introduced into the flame, a large increase in ions occurs. A collector with a polarizing voltage is applied near the flame and the ions are attracted and produce a current, which is proportional to the amount of the sample compound in the flame. The electrical current causes the computing integrator to record a peak on a chromatogram. By measuring the area of the peak and comparing that area to the integrator response of a known aqueous standard, the concentration of the analyte in the sample is determined.

TCD Process

The TCD responds to any compounds whose thermal conductivity differs from that of the carrier gas in the GC. Under constant applied voltage, a filament in the cell of the TCD heats up and its resistance increases. As the carrier gas passes over the filament, it maintains constant temperature and therefore constant resistance in the filament. The addition of the sample to the cell results in increased temperature and increased filament resistance. This change is measured by the detector and the integrator produces a peak on a chromatogram.

4.3 Analyses

The detection limits for target compounds depend on the sensitivity of the detector to the individual compound as well as the volume of the injection. The detection limits of the target compounds were calculated from the response factor, the sample size, and the calculated minimum peak size (area) observed under the conditions of the analyses. If any compound was not detected in an analysis, the detection limit is given as a "less than" value, e.g., <0.01 ug/l. The approximate detection limits for the target compounds are presented in the table on the following page.

Table 1. Detection Limits for Soil Gas Compounds

Compound	Detection Limits (ug/l)
CO_2	310
CH_4	680
Benzene	0.02
Toluene	0.05
Ethylbenzene	0.1
Xylenes	0.2
TVHC	0.2

5.0 QUALITY ASSURANCE AND QUALITY CONTROL

Tracer Research's Quality Assurance (QA) and Quality Control (QC) program was followed to maintain data that was reproducible through the investigation. An overview presenting the significant aspects of this program is presented below.

Soil Gas Sampling Quality Assurance

To ensure consistent collection of soil gas, the following procedures are performed:

- Sampling Manifolds

Tracer Research's custom designed sampling manifold connects the sample probe to the vacuum line and pump. The manifold is designed to eliminate sample exposure to the polymeric (plastic) materials that connect the probe to the vacuum pump.

The sampling manifold is attached to the end of the probe, forming an air tight union between the probe and the silicone tubing septum. The septum connects the manifold to the pump vacuum line and permits syringe sampling.

This sampling system allows the sample to be taken upstream of the sampling pump, manifold, and septum. Since cross contamination of sampling equipment can

be a major problem, Tracer Research replaces the materials (probe and syringe), between sampling points, that contact the soil gas before or during sampling.

-Sampling Probes

Steel probes are used only once each day. To eliminate the possibility of cross contamination, they are washed with high pressure soap and hot water spray, or steam-cleaned. Enough sampling probes are carried on each van to avoid the need to re-use any during the day.

-Glass Syringes

Glass syringes are used for only one sample a day and are washed and baked out at night. If they must be used twice, they are purged with carrier gas (nitrogen) and baked out between probe samplings.

-Sampling Efficiency

Soil gas pumping is monitored by a vacuum gauge to ensure that an adequate flow of gas from the soil is maintained. A reliable gas sample can be obtained if the sample vacuum gauge reading is at least 2 inches Hg less than the maximum measured vacuum of the vacuum pump.

Analytical Quality Assurance Samples

Quality assurance samples are performed at the below listed, or greater, frequencies. The frequency depends on the number of soil gas samples analyzed and the length of time of the survey:

Table 2. Quality Assurance Samples

Sample type	Frequency
Ambient Air Samples	2 per day or per site
Analytical Method Blanks	5% (1 per 20 samples or 1 a day)
Continuing Calibration Check	20% (1 every 5 samples)
Replicate Samples	10% to 100% of all samples
Reagent Blank	1 per set of working standards

The ambient air samples are obtained on site by sampling the air immediately outside the mobile analytical van and directly injecting it into the GC. Analytical method blanks are taken to demonstrate that the analytical instrumentation is not contaminated. These are performed by injecting carrier gas (nitrogen) into the GC with the sampling syringe. Subsampling syringes are also checked in this fashion.

The injector port septa through which soil gas samples are injected into the GC are replaced daily to prevent possible gas leaks from the chromatographic column. All sampling and subsampling syringes are decontaminated after use and are not used again until they have been decontaminated by washing in anionic detergent and baking at 90°C.

Field system blanks are analyzed to check for contamination of the sampling apparatus, e.g., probe and sampling syringe. A sample is collected using standard soil gas sampling procedures, but without putting the probe into the ground. The

results are compared to those obtained from a concurrently sampled ambient air analysis.

If the blanks detect compounds of interest at concentrations that indicate equipment contamination or concentrations that exceed normal background levels (ambient air analysis), corrective actions are performed. If the problem cannot be corrected, an out-of-control event is documented and reported.

A reagent blank is performed to ensure the solvent used to dilute the stock standards is not contaminated. Analytical instruments are calibrated daily using fresh working standards made from National Institute of Sciences and Technology traceable standards and reagent blanked solvents.

6.0 RESULTS

The analytical results from this soil gas investigation are condensed in Appendix A. The data are presented by site, sampling location and by analyte concentration. When the compound was not detected, the detection limit is presented as a "less than" value, e.g., <0.01 ug/l.

Soil gas samples are identified by sample location and sampling depth. For example, SG-1-3' represents soil gas sample number one, collected at a depth of 3 feet below the ground surface.

A summary of the soil gas results for each of the twenty survey sites is presented in tables on the following pages. A sampling location map and plotted concentrations for detected compounds for each site are presented in Appendix B.

Site No. 42 East (22 samples - Figure 1)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	700	32,000	SG-49-3'
CH_4	0	NA	NA	NA
Benzene	5	0.04	0.5	SG-42-3'
Toluene	5	0.2	1	SG-42,43-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	7	0.5	13	SG-51-3'

NA = Not Applicable

Site No. 42 West (37 samples - Figure 2)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	32	770	6,500	SG-69-3'
CH_4	0	NA	NA	NA
Benzene	3	0.06	0.2	SG-67-3'
Toluene	3	0.2	0.4	SG-78-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	1	NA	1	SG-67-3'

NA = Not Applicable

Site No. 43 (25 samples - Figure 3)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	25	1,800	13,000	SG-109-3'
CH_4	0	NA	NA	NA
Benzene	6	0.04	0.2	SG-103,117-3'
Toluene	4	0.1	0.3	SG-117-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	2	2	3	SG-99-3'
TVHC	5	0.4	3	SG-99,117-3'

NA = Not Applicable

Site No. 73 (57 samples - Figure 4)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	54	530	24,000	SG-7-3'
CH_4	0	NA	NA	NA
Benzene	18	0.04	0.9	SG-268-3'
Toluene	23	0.09	1	SG-7,29-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	28	0.2	36	SG-24-3'

NA = Not Applicable

UST 64 (20 samples - Figure 5)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	15	800	3,400	SG-283-3'
CH_4	0	NA	NA	NA
Benzene	9	0.06	0.5	SG-281,283-3'
Toluene	5	0.1	0.5	SG-281-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	6	0.4	3	SG-281-3'

NA = Not Applicable

UST 76 (20 samples - Figure 6)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	610	2,500	SG-361-3'
CH_4	0	NA	NA	NA
Benzene	14	0.05	1	SG-361-3'
Toluene	10	0.1	1	SG-361-3'
Ethylbenzene	1	NA	0.5	SG-361-3'
Xylenes	0	NA	NA	NA
TVHC	12	0.2	6	SG-361-3'

NA = Not Applicable

UST 77 (20 samples - Figure 7)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	1,200	12,000	SG-148-3'
CH_4	0	NA	NA	NA
Benzene	5	0.05	0.3	SG-142-3'
Toluene	4	0.08	0.3	SG-148-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	4	0.2	1	SG-142,143,148-3'

NA = Not Applicable

UST 79 (16 samples - Figure 8)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	16	670	2,700	SG-426-3'
CH_4	0	NA	NA	NA
Benzene	13	0.05	1	SG-425-3'
Toluene	7	0.09	1	SG-425-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	11	0.6	5	SG-425-3'

NA = Not Applicable

UST 80 (20 samples - Figure 9)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	460	1,300	SG-364-3'
CH_4	0	NA	NA	NA
Benzene	13	0.04	0.4	SG-364-3'
Toluene	7	0.1	0.4	SG-364-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	6	0.3	2	SG-364-3'

NA = Not Applicable

UST 81 (10 samples - Figure 10)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	10	690	2,900	SG-325-3'
CH_4	0	NA	NA	NA
Benzene	9	0.03	0.7	SG-321-3'
Toluene	8	0.1	0.5	SG-321-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	8	0.2	4	SG-321-3'

NA = Not Applicable

UST 82 (19 samples - Figure 11)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	19	690	3,800	SG-438-3'
CH_4	0	NA	NA	NA
Benzene	16	0.03	0.6	SG-327-3'
Toluene	11	0.1	0.6	SG-327-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	10	0.3	2	SG-327,340,437-3'

NA = Not Applicable

UST 84 (18 samples - Figure 12)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	18	530	1,100	SG-401-3'
CH_4	0	NA	NA	NA
Benzene	11	0.05	0.4	SG-388-3'
Toluene	5	0.1	0.4	SG-387-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	11	0.3	7	SG-394-3'

NA = Not Applicable

UST 86 (24 samples - Figure 13)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	24	740	7,200	SG-181-3'
CH_4	0	NA	NA	NA
Benzene	2	NA	0.2	SG-165,182-3'
Toluene	2	NA	0.2	SG-165,182-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	3	0.7	1	SG-167,182,184-3'

NA = Not Applicable

UST 88 (20 samples - Figure 14)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	19	940	4,800	SG-224-3'
CH_4	0	NA	NA	NA
Benzene	1	NA	0.8	SG-223-3'
Toluene	1	NA	0.7	SG-223-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	1	NA	3	SG-223-3'

NA = Not Applicable

UST 89 (20 samples - Figure 15)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	1,300	3,400	SG-226-3'
CH_4	0	NA	NA	NA
Benzene	0	NA	NA	NA
Toluene	0	NA	NA	NA
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	0	NA	NA	NA

NA = Not Applicable

UST 90 (20 samples - Figure 16)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	1,000	2,700	SG-249-3'
CH_4	0	NA	NA	NA
Benzene	4	0.08	0.9	SG-261-3'
Toluene	4	0.2	0.6	SG-261-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	4	0.6	4	SG-261-3'

NA = Not Applicable

UST 91 (20 samples - Figure 17)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	680	3,500	SG-122-3'
CH_4	0	NA	NA	NA
Benzene	5	0.07	2	SG-122-3'
Toluene	4	0.1	2	SG-122-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	1	NA	2	SG-136-3'
TVHC	5	0.4	11	SG-122-3'

NA = Not Applicable

UST 99 (20 samples - Figure 18)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	20	1,100	4,000	SG-192-3'
CH_4	0	NA	NA	NA
Benzene	2	0.2	0.3	SG-196-3'
Toluene	2	NA	0.2	SG-195,196-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	2	NA	1	SG-195,196-3'

NA = Not Applicable

UST 100 (18 samples - Figure 19)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	18	1,100	10,000	SG-429-3'
CH_4	0	NA	NA	NA
Benzene	10	0.04	0.7	SG-454-3'
Toluene	2	0.4	0.5	SG-454-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	3	1	2	SG-431,432-3'
TVHC	11	0.4	110	SG-444-3'

NA = Not Applicable

UST 102 (29 samples - Figure 20)

Compound	# of samples in which compound was detected	Low conc. ug/L	High conc. ug/L	Sample(s) with high conc.
CO_2	27	660	1,900	SG-451-3'
CH_4	0	NA	NA	NA
Benzene	19	0.06	0.7	SG-298-3'
Toluene	19	0.1	20	SG-439-3'
Ethylbenzene	0	NA	NA	NA
Xylenes	0	NA	NA	NA
TVHC	20	0.3	60	SG-439-3'

NA = Not Applicable

APPENDIX A Condensed Data

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
9/23/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	<3600	<100	<0.1	<0.4	<0.9	<1	<1
SG-1-3'	73	6400	<100	<0.04	0.09	<0.2	<0.3	<0.3
SG-2-3'	73	6300	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-3-3'	73	8800	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-4-3'	73	5000	<100	<0.04	<0.09	<0.2	<0.3	1
SG-5-3'	73	14000	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-6-3'	73	<6000	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-7-3'	73	24000	<100	<0.04	1	<0.2	<0.3	3
SG-8-3'	73	9000	<100	<0.04	<0.09	<0.2	<0.3	<0.3
AIR	73	<580	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-9-3'	73	2800	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-10-3'	73	4500	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-11-3'	73	6900	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-12-3'	73	7200	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-13-3'	73	8900	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-14-3'	73	3500	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-15-3'	73	12000	<100	<0.04	<0.09	<0.2	<0.3	<0.3
SG-16-3'	73	22000	<100	<0.04	<0.09	<0.2	<0.3	1
AIR	73	<3300	<100	<0.04	<0.09	<0.2	<0.3	<0.3

UST-IR
D-23

Analyzed by: C. Poff
Proofed by: Kim

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
9/24/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	<57	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-17-3'	73	8500	<42	<0.04	0.1	<0.2	<0.3	1
SG-18-3'	73	19000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-19-3'	73	15000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-20-3'	73	15000	<42	<0.04	0.09	<0.2	<0.3	0.8
SG-21-3'	73	50000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-22-3'	73	610	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-23-3'	73	8700	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-24-3'	73	11000	<42	<0.04	<0.09	<0.2	<0.3	36
AIR	73	INT	<42	<0.04	<0.09	<0.2	<0.3	0.6
SG-25-3'	73	<290	<42	<0.04	0.5	<0.2	<0.3	4
SG-26-3'	73	6400	<42	<0.04	0.2	<0.2	<0.3	4
SG-27-3'	73	23000	<42	<0.04	<0.09	<0.2	<0.3	1
SG-28-3'	73	23000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-29-3'	73	<570	<42	<0.04	1	<0.2	<0.3	8
SG-30-3'	73	8000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-31-3'	73	13000	<42	<0.04	<0.09	<0.2	<0.3	<0.3
SG-32-3'	73	8400	<42	<0.04	0.1	<0.2	<0.3	3
AIR	73	<57	<42	<0.04	<0.09	<0.2	<0.3	<0.3

INT interference with adjacent peak

UST-IR
D-24

Analyzed by: C. Poff
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TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
9/25/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	<60	<200	<0.05	<0.1	<0.3	<0.4	<0.4
SG-33-3'	73	21000	<200	<0.05	0.2	<0.3	<0.4	1
SG-34-3'	73	3400	<200	<0.05	<0.1	<0.3	<0.4	0.5
SG-35-3'	73	7100	<200	<0.05	<0.1	<0.3	<0.4	<0.4
AIR	73	<60	<200	<0.05	<0.1	<0.3	<0.4	<0.4
SG-36-3'	73	13000	<200	0.09	<0.1	<0.3	<0.4	<0.4
SG-37-3'	42 east	11000	<200	0.1	0.4	<0.3	<0.4	0.7
SG-38-3'	42 east	20000	<200	<0.05	<0.1	<0.3	<0.4	<0.4
SG-39-3'	42 east	5900	<200	<0.05	<0.1	<0.3	<0.4	<0.4
SG-40-3'	42 east	4400	<200	<0.05	0.5	<0.3	<0.4	1
SG-41-3' no sample								
SG-42-3'	42 east	14000	<200	0.5	1	<0.3	<0.4	11
SG-43-3'	42 east	14000	<390	0.3	1	<0.3	<0.4	8
SG-44-3'	42 east	10000	<390	<0.05	<0.1	<0.3	<0.4	<0.4
AIR	42 east	120	<200	<0.05	<0.1	<0.3	<0.4	<0.4

UST-IR
D-25

Analyzed by: C. Poff
Proofed by: Km

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/05/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	42 east	960	<180	<0.04	<0.1	<0.3	<0.4	<0.4
SG-45-3'	42 east	3800	<180	<0.04	<0.1	<0.3	<0.4	<0.4
SG-46-3'	42 east	2400	<180	<0.04	<0.1	<0.3	<0.4	<0.4
SG-47-3'	42 east	<60	<180	0.09	0.2	<0.3	<0.4	0.5
SG-48-3'	42 east	5700	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-49-3'	42 east	32000	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-50-3'	42 east	700	<360	0.04	<0.1	<0.3	<0.4	<0.4
SG-51-3'	42 east	4400	<360	<0.04	<0.1	<0.3	<0.4	13
SG-52-3'	42 east	4200	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-53-3'	42 east	5000	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-54-3'	42 east	29000	<180	<0.04	<0.1	<0.3	<0.4	2
AIR	42 east	<60	<180	<0.04	<0.1	<0.3	<0.4	<0.4
SG-55-3'	42 east	8800	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-56-3'	42 east	4700	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-57-3'	42 east	5100	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-58-3'	42 east	6100	<360	<0.04	<0.1	<0.3	<0.4	2
SG-59-3'	42 west	<120	<360	<0.04	<0.1	<0.3	<0.4	<0.4
SG-60-3'	42 west	NA	NA	<0.04	<0.1	<0.3	<0.4	<0.4
SG-61-3'	42 west	NA	NA	<0.04	<0.1	<0.3	<0.4	<0.4
SG-62-3'	42 west	NA	NA	<0.04	<0.1	<0.3	<0.4	<0.4
AIR	42 west	<60	<180	<0.04	<0.1	<0.3	<0.4	<0.4

UST-IR
D-26

NA not analyzed

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/06/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	42 west	<61	<160	<0.06	<0.1	<0.4	<0.4	<0.5
SG-63-3'	42 west	<120	<320	<0.06	<0.1	<0.4	<0.5	<0.5
SG-64-3'	42 west	1400	<320	<0.06	<0.1	<0.4	<0.5	<0.5
SG-65-3'	42 west	4000	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-66-3'	42 west	1700	<320	<0.06	<0.1	<0.4	<0.5	<0.5
SG-67-3'	42 west	3400	<1600	0.2	0.2	<0.4	<0.5	1
AIR	42 west	<120	<320	<0.06	<0.1	<0.4	<0.5	<0.5
SG-68-3'	42 west	770	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-69-3'	42 west	6500	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-70-3'	42 west	1100	<1600	0.06	<0.1	<0.4	<0.5	<0.5
SG-71-3'	42 west	1200	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-72-3'	42 west	3200	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-73-3'	42 west	3600	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
SG-74-3'	42 west	4100	<1600	<0.06	<0.1	<0.4	<0.5	<0.5
AIR	42 west	<610	<1600	<0.06	<0.1	<0.4	<0.5	<0.5

UST-IR
D-27

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/07/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	42 west	<58	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-75-3'	42 west	2700	<810	0.1	0.2	<0.2	<0.4	<0.4
SG-76-3'	42 west	5700	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-77-3'	42 west	3600	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-78-3'	42 west	3700	<810	<0.04	0.4	<0.2	<0.4	<0.4
SG-79-3'	42 west	4200	<810	<0.04	<0.1	<0.2	<0.4	<0.4
AIR	42 west	960	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-80-3'	42 west	4000	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-81-3'	42 west	4600	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-82-3'	42 west	5000	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-83-3'	42 west	6100	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-84-3'	42 west	4100	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-85-3'	42 west	2600	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-86-3'	42 west	1700	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-87-3'	42 west	4600	<810	<0.04	<0.1	<0.2	<0.4	<0.4
SG-88-3'	42 west	1700	<810	<0.04	<0.1	<0.2	<0.4	<0.4
AIR	42 west	<290	<810	<0.04	<0.1	<0.2	<0.4	<0.4

UST-IR
D-28

Analyzed by: C. Poff
Proofed by: Km

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/08/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	42 west	<280	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-89-3'	42 west	980	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-90-3'	42 west	1600	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-91-3'	42 west	2200	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-92-3'	42 west	1400	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-93-3'	42 west	1100	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-94-3'	42 west	1300	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-95-3'	42 west	3200	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-96-3'	43	12000	<830	<0.05	<0.1	<0.4	<0.4	<0.4
AIR	43	<280	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-97-3'	43	6500	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-98-3'	43	2800	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-99-3'	43	2800	<830	<0.05	<0.1	<0.4	3	3
SG-100-3'	43	3300	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-101-3'	43	5700	<830	<0.05	<0.1	<0.4	2	2
SG-102-3'	43	2700	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-103-3'	43	3000	<830	0.2	0.2	<0.4	<0.4	0.4
SG-104-3'	43	2600	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-105-3'	43	11000	<830	<0.05	<0.1	<0.4	<0.4	<0.4
SG-106-3'	43	9800	<830	<0.05	<0.1	<0.4	<0.4	<0.4
AIR	43	<280	<830	<0.05	<0.1	<0.4	<0.4	<0.4

UST-IR
D-29

Analyzed by: C. Poff
Proofed by: KM

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/09/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	43	1400	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-107-3'	43	4700	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-108-3'	43	4500	<1000	0.1	0.1	<0.3	<0.3	0.5
SG-109-3'	43	13000	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-110-3'	43	2400	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-111-3'	43	2100	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-112-3'	43	1700	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-113-3'	43	2100	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-114-3'	43	1800	<1000	0.08	0.1	<0.3	<0.3	<0.3
SG-115-3'	43	8300	<1000	0.04	<0.1	<0.3	<0.3	<0.3
SG-116-3'	43	9000	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
AIR	43	730	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-117-3'	43	2000	<1000	0.2	0.3	<0.3	<0.3	3
SG-118-3'	43	2100	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-119-3'	43	2300	<1000	0.04	<0.1	<0.3	<0.3	<0.3
SG-120-3'	43	1900	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-121-3'	UST 91	2000	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-122-3'	UST 91	3500	<1000	2	2	<0.3	<0.3	11
SG-123-3'	UST 91	1600	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-124-3'	UST 91	1700	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
SG-125-3'	UST 91	1500	<1000	<0.04	<0.1	<0.3	<0.3	<0.3
AIR	UST 91	<300	<1000	<0.04	<0.1	<0.3	<0.3	<0.3

UST-IR
D-30

Analyzed by: C. Poff
Proofed by: KM

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TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/10/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 91	1800	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-126-3'	UST 91	1900	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-127-3'	UST 91	1100	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-128-3'	UST 91	1500	<1000	0.07	0.1	<0.1	<0.2	0.5
SG-129-3'	UST 91	1700	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-130-3'	UST 91	1300	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-131-3'	UST 91	900	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-132-3'	UST 91	680	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-133-3'	UST 91	1900	<1000	0.4	0.6	<0.1	<0.2	2
SG-134-3'	UST 91	1600	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-135-3'	UST 91	1700	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
AIR	UST 91	630	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-136-3'	UST 91	1700	<1000	0.04	<0.05	<0.1	2	2
SG-137-3'	UST 91	1400	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-138-3'	UST 91	1200	<1000	0.07	0.1	<0.1	<0.2	0.4
SG-139-3'	UST 91	1500	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-140-3'	UST 91	1700	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
SG-141-3'	UST 77	4700	<1000	0.08	<0.05	<0.1	<0.2	<0.2
SG-142-3'	UST 77	2700	<1000	0.3	0.2	<0.1	<0.2	1
SG-143-3'	UST 77	2400	<1000	0.2	0.2	<0.1	<0.2	1
SG-144-3'	UST 77	2900	<1000	<0.02	<0.05	<0.1	<0.2	<0.2
AIR	UST 77	560	<1000	<0.02	<0.05	<0.1	<0.2	<0.2

UST-IR
D-31

Analyzed by: C. Poff
Proofed by: Km

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/11/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 77	1300	<870	<0.02	<0.04	<0.09	<0.1	0.8
SG-145-3'	UST 77	1900	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-146-3'	UST 77	3000	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-147-3'	UST 77	4000	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-148-3'	UST 77	12000	<870	0.2	0.3	<0.09	<0.1	1
SG-149-3'	UST 77	5100	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-150-3'	UST 77	1200	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-151-3'	UST 77	2600	<870	0.05	0.08	<0.09	<0.1	0.2
SG-152-3'	UST 77	2600	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-153-3'	UST 77	5700	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-154-3'	UST 77	4300	<870	<0.02	<0.04	<0.09	<0.1	<0.1
AIR	UST 77	680	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-155-3'	UST 77	8600	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-156-3'	UST 77	6700	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-157-3'	UST 77	1200	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-158-3'	UST 77	2200	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-159-3'	UST 77	3600	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-160-3'	UST 77	1600	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-161-3'	UST 86	2600	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-162-3'	UST 86	1500	<870	<0.02	<0.04	<0.09	<0.1	<0.1
SG-163-3'	UST 86	1800	<870	<0.02	<0.04	<0.09	<0.1	<0.1
AIR	UST 86	1000	<870	<0.02	<0.04	<0.09	<0.1	<0.1

UST-IR
D-32

Analyzed by: C. Poff
Proofed by: Km

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/12/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 86	560	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-164-3'	UST 86	1800	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-165-3'	UST 86	1700	<890	0.2	0.2	<0.09	<0.2	0.7
SG-166-3'	UST 86	1800	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-167-3'	UST 86	1300	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-168-3'	UST 86	1400	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-169-3'	UST 86	1300	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-170-3'	UST 86	1100	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-171-3'	UST 86	1600	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-172-3'	UST 86	2000	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-173-3'	UST 86	2100	<890	<0.02	<0.04	<0.09	<0.2	<0.1
AIR	UST 86	580	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-174-3'	UST 86	1900	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-175-3'	UST 86	2500	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-176-3'	UST 86	3100	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-177-3'	UST 86	1500	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-178-3'	UST 86	2000	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-179-3'	UST 86	2200	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-180-3'	UST 86	2000	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-181-3'	UST 86	7200	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-182-3'	UST 86	740	<890	0.2	0.2	<0.09	<0.2	1
SG-183-3'	UST 86	1600	<890	<0.02	<0.04	<0.09	<0.2	<0.1
SG-184-3'	UST 86	2200	<890	<0.02	<0.04	<0.09	<0.2	1
AIR	UST 86	700	<890	<0.02	<0.04	<0.09	<0.2	<0.1

UST-IR
D-33

Analyzed by: C. Poff
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Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/19/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 99	2400	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-185-3'	UST 99	2900	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-186-3'	UST 99	1100	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-187-3'	UST 99	3500	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-188-3'	UST 99	3300	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-189-3'	UST 99	2300	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-190-3'	UST 99	3900	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-191-3'	UST 99	2100	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-192-3'	UST 99	4000	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-193-3'	UST 99	3200	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-194-3'	UST 99	3400	<900	<0.04	<0.09	<0.2	<0.4	<0.4
SG-195-3'	UST 99	3800	<900	0.2	0.2	<0.2	<0.4	1
SG-196-3'	UST 99	2400	<900	0.3	0.2	<0.2	<0.4	1
SG-197-3'	UST 99	1500	<900	<0.4	<0.09	<0.2	<0.4	<0.4
SG-198-3'	UST 99	3200	<900	<0.4	<0.09	<0.2	<0.4	<0.4
AIR	UST 99	650	<900	<0.4	<0.09	<0.2	<0.4	<0.4

UST-IR
D-34

Analyzed by: C. Poff
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TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/20/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 99	<340	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-199-3'	UST 99	2900	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-200-3'	UST 99	2300	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-201-3'	UST 99	2000	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-202-3'	UST 99	2500	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-203-3'	UST 99	1600	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-204-3'	UST 99	3100	<840	<0.03	<0.08	<0.2	<0.3	<0.3
AIR	UST 88	2000	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-205-3'	UST 88	1800	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-206-3'	UST 88	1900	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-207-3'	UST 88	2200	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-208-3'	UST 88	1800	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-209-3'	UST 88	2100	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-210-3'	UST 88	1600	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-211-3'	UST 88	<340	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-212-3'	UST 88	1300	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-213-3'	UST 88	1400	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-214-3'	UST 88	2600	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-215-3'	UST 88	940	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-216-3'	UST 88	2700	<840	<0.03	<0.08	<0.2	<0.3	<0.3
SG-217-3'	UST 88	3600	<840	<0.03	<0.08	<0.2	<0.3	<0.3
AIR	UST 88	1000	<840	<0.03	<0.08	<0.2	<0.3	<0.3

UST-IR
D-35

Analyzed by: C. Poff
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TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/21/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 88	1900	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-218-3'	UST 88	3200	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-219-3'	UST 88	2500	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-220-3'	UST 88	2200	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-221-3'	UST 88	2500	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-222-3'	UST 88	2000	<880	<0.03	<0.08	<0.2	<0.3	<0.3
AIR	UST 88	420	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-223-3'	UST 88	2900	<880	0.8	0.7	<0.2	<0.3	3
SG-224-3'	UST 88	4800	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-225-3'	UST 89	2400	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-226-3'	UST 89	3400	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-227-3'	UST 89	1900	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-228-3'	UST 89	1800	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-229-3'	UST 89	2300	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-230-3'	UST 89	1500	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-231-3'	UST 89	2100	<880	<0.03	<0.08	<0.2	<0.3	<0.3
SG-232-3'	UST 89	1300	<880	<0.03	<0.08	<0.2	<0.3	<0.3
AIR	UST 89	2500	<880	<0.03	<0.08	<0.2	<0.3	<0.3

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/22/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 89	<340	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-233-3'	UST 89	3000	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-234-3'	UST 89	2600	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-235-3'	UST 89	2500	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-236-3'	UST 89	2000	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-237-3'	UST 89	2300	<3500	<0.04	<0.1	<0.2	<0.4	<0.4
SG-238-3'	UST 89	1600	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-239-3'	UST 89	2200	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-240-3'	UST 89	1900	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-241-3'	UST 89	1500	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-242-3'	UST 89	1600	<870	<0.04	<0.1	<0.2	<0.4	<0.4
AIR	UST 89	970	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-243-3'	UST 89	2100	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-244-3'	UST 89	2400	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-245-3'	UST 90	1600	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-246-3'	UST 90	2100	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-247-3'	UST 90	2000	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-248-3'	UST 90	2100	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-249-3'	UST 90	2700	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-250-3'	UST 90	1500	<870	<0.04	<0.1	<0.2	<0.4	<0.4
SG-251-3'	UST 90	2100	<870	<0.04	<0.1	<0.2	<0.4	<0.4
AIR	UST 90	1100	<870	<0.04	<0.1	<0.2	<0.4	<0.4

UST-IR
D-37

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/23/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 90	1400	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-252-3'	UST 90	1800	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-253-3'	UST 90	2100	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-254-3'	UST 90	1800	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-255-3'	UST 90	2400	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-256-3'	UST 90	1600	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-257-3'	UST 90	2600	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-258-3'	UST 90	1900	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-259-3'	UST 90	1100	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-260-3'	UST 90	1600	<890	<0.04	<0.09	<0.2	<0.3	<0.3
SG-261-3'	UST 90	2600	<890	0.9	0.6	<0.2	<0.3	4
AIR	UST 90	770	<890	0.04	<0.09	<0.2	<0.3	<0.3
SG-262-3'	UST 90	2300	<890	0.08	0.2	<0.2	<0.3	0.6
SG-263-3'	UST 90	1100	<890	0.2	0.2	<0.2	<0.3	0.9
SG-264-3'	UST 90	1000	<890	0.3	0.3	<0.2	<0.3	2
AIR	UST 90	1100	<890	<0.04	<0.09	<0.2	<0.3	<0.3

UST-IR
D-38

Analyzed by: C. Poff
Proofed by: Km

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/27/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	<390	<870	<0.04	<0.1	<0.2	<0.3	<0.3
SG-265-3'	73	2900	<870	0.6	0.1	<0.2	<0.4	8
SG-266-3'	73	4300	<870	0.4	0.2	<0.2	<0.4	4
SG-267-3'	73	3900	<870	0.3	0.2	<0.2	<0.4	0.8
SG-268-3'	73	4000	<1700	0.9	0.8	<0.2	<0.4	5
SG-269-3'	73	3800	<1700	0.04	0.1	<0.2	<0.4	2
AIR	73	2500	<870	<0.04	<0.1	<0.2	<0.4	<0.3

UST-IR
D-39

Analyzed by: C. Poff
Proofed by: Kim

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/28/92

SAMPLE	SITE	CO_2 ug/l	CH_4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 64	2900	<2700	<0.04	<0.09	<0.2	<0.3	<0.3
SG-270-3'	UST 64	1400	<2700	<0.04	<0.09	<0.2	<0.3	<0.3
SG-271-3'	UST 64	1800	<2700	<0.04	<0.09	<0.2	<0.3	<0.3
SG-272-3'	UST 64	1900	<2700	<0.04	<0.09	<0.2	<0.3	<0.3
SG-273-3'	UST 64	1500	<2700	<0.04	<0.09	<0.2	<0.3	<0.3
SG-274-3'	UST 64	1600	<1300	0.06	<0.09	<0.2	<0.3	<0.3
SG-275-3'	UST 64	1500	<1300	0.1	<0.09	<0.2	<0.3	<0.3
SG-276-3'	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-277-3'	UST 64	1300	<1300	0.09	0.1	<0.2	<0.3	0.6
SG-278-3'	UST 64	1800	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-279-3'	UST 64	1900	<1300	0.2	0.2	<0.2	<0.3	1
AIR	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-280-3'	UST 64	1500	<1300	0.06	<0.09	<0.2	<0.3	<0.3
SG-281-3'	UST 64	1900	<1300	0.5	0.5	<0.2	<0.3	3
SG-282-3'	UST 64	1500	<1300	0.1	0.1	<0.2	<0.3	0.6
SG-283-3'	UST 64	3400	<1300	0.5	0.4	<0.2	<0.3	2
SG-284-3'	UST 64	1300	<1300	0.1	<0.09	<0.2	<0.3	0.4
SG-285-3'	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-286-3'	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-287-3'	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
SG-288-3'	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3
AIR	UST 64	<640	<1300	<0.04	<0.09	<0.2	<0.3	<0.3

UST-IR
D-40

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/29/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 64	920	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-289-3'	UST 64	800	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-290-3'	UST 102	740	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-291-3'	UST 102	800	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-292-3'	UST 102	720	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-293-3'	UST 102	<310	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-294-3'	UST 102	700	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-295-3'	UST 102	670	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-296-3'	UST 102	870	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-297-3'	UST 102	930	<680	0.1	0.3	<0.2	<0.3	0.9
SG-298-3'	UST 102	1300	<680	0.7	0.6	<0.2	<0.3	3
AIR	UST 102	900	<680	<0.04	<0.1	<0.2	<0.3	<0.3
SG-299-3'	UST 102	1200	<680	0.5	0.9	<0.2	<0.3	4
SG-300-3'	UST 102	1500	<680	0.4	0.8	<0.2	<0.3	4
SG-301-3'	UST 102	<310	<680	0.06	0.1	<0.2	<0.3	0.3
SG-302-3'	UST 102	1400	<680	0.6	0.6	<0.2	<0.3	3
SG-303-3'	UST 102	670	<680	0.1	0.2	<0.2	<0.3	0.5
SG-304-3'	UST 102	680	<680	0.2	0.2	<0.2	<0.3	0.8
SG-305-3'	UST 102	990	<680	0.3	0.2	<0.2	<0.3	1
SG-306-3'	UST 102	900	<680	0.2	0.2	<0.2	<0.3	0.9
SG-307-3'	UST 102	840	<680	0.1	0.2	<0.2	<0.3	0.4
SG-308-3'	UST 102	670	<680	0.2	0.2	<0.2	<0.3	0.5
SG-309-3'	UST 102	660	<680	0.1	0.2	<0.2	<0.3	0.9
AIR	UST 102	4400	<680	<0.04	<0.1	<0.2	<0.3	<0.3

UST-IR
D-41

Analyzed by: C. Poff
Proofed by: Km

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
10/30/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	3900	<730	<0.02	<0.04	<0.09	<0.1	<0.1
SG-310-3'	73	590	<730	0.05	0.4	<0.09	<0.1	0.7
SG-311-3'	73	690	<730	0.1	0.1	<0.09	<0.1	0.4
SG-312-3'	73	910	<730	0.1	0.2	<0.09	<0.1	0.5
SG-313-3'	73	920	<730	0.05	0.1	<0.09	<0.1	0.2
SG-314-3'	73	580	<730	0.1	0.2	<0.09	<0.1	0.6
SG-315-3'	73	1100	<730	0.2	0.3	<0.09	<0.1	1
SG-316-3'	73	810	<730	0.1	0.2	<0.09	<0.1	0.8
SG-317-3'	UST 81	760	<730	0.2	0.2	<0.09	<0.1	0.9
SG-318-3'	UST 81	800	<730	0.1	0.1	<0.09	<0.1	0.2
SG-319-3'	UST 81	810	<730	0.1	0.2	<0.09	<0.1	0.6
AIR	UST 81	1200	<730	<0.02	<0.04	<0.09	<0.1	<0.1
SG-320-3'	UST 81	690	<730	0.2	0.1	<0.09	<0.1	0.9
SG-321-3'	UST 81	2600	<730	0.7	0.5	<0.09	<0.1	4
SG-322-3'	UST 81	1100	<730	0.3	0.4	<0.09	<0.1	2
SG-323-3'	UST 81	750	<730	<0.02	<0.04	<0.09	<0.1	<0.1
SG-324-3'	UST 81	850	<730	0.03	<0.04	<0.09	<0.1	<0.1
SG-325-3'	UST 81	2900	<730	0.4	0.4	<0.09	<0.1	2
SG-326-3'	UST 81	1200	<730	0.4	0.2	<0.09	<0.1	2
AIR	UST 81	1100	<730	<0.02	<0.04	<0.09	<0.1	<0.1

UST-IR
D-42

Analyzed by: C. Poff
Proofed by: KMn

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/02/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 82	2300	<700	<0.03	<0.08	<0.2	<0.3	<0.3
SG-327-3'	UST 82	1500	<700	0.6	0.6	<0.2	<0.3	2
SG-328-3'	UST 82	1200	<700	0.03	<0.08	<0.2	<0.3	<0.3
SG-329-3'	UST 82	1200	<700	0.2	0.2	<0.2	<0.3	0.7
SG-330-3'	UST 82	1000	<700	0.1	0.1	<0.2	<0.3	0.5
SG-331-3'	UST 82	1000	<700	0.1	0.2	<0.2	<0.3	0.5
SG-332-3'	UST 82	1100	<700	0.1	0.2	<0.2	<0.3	0.7
SG-333-3'	UST 82	880	<700	0.05	<0.08	<0.2	<0.3	<0.3
SG-334-3'	UST 82	900	<700	0.05	<0.08	<0.2	<0.3	<0.3
SG-335-3'	UST 82	1100	<700	0.05	0.1	<0.2	<0.3	<0.3
SG-336-3'	UST 82	1100	<700	0.08	0.1	<0.2	<0.3	0.3
AIR	UST 82	810	<700	<0.03	<0.08	<0.2	<0.3	<0.3
SG-337-3'	UST 82	1000	<700	0.05	<0.08	<0.2	<0.3	<0.3
SG-338-3'	UST 82	930	<700	<0.03	<0.08	<0.2	<0.3	<0.3
SG-339-3'	UST 82	910	<700	0.1	0.1	<0.2	<0.3	0.8
SG-340-3'	UST 82	1100	<700	0.4	0.1	<0.2	<0.3	2
SG-341-3'	UST 82	850	<700	0.09	0.1	<0.2	<0.3	0.6
SG-342-3'	UST 82	1600	<700	<0.03	<0.08	<0.2	<0.3	<0.3
SG-343-3'	UST 82	690	<700	<0.03	<0.08	<0.2	<0.3	<0.3
AIR	UST 82	2500	<700	<0.03	<0.08	<0.2	<0.3	<0.3

UST-IR
D-43

Analyzed by: C. Poff
Proofed by: KMn

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/03/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 76	1100	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-344-3'	UST 76	670	<730	0.06	0.1	<0.1	<0.1	4
SG-345-3'	UST 76	560	<730	0.05	<0.04	<0.1	<0.1	0.2
SG-346-3'	UST 76	1000	<730	0.07	<0.04	<0.1	<0.1	<0.1
SG-347-3'	UST 76	970	<730	0.1	0.2	<0.1	<0.1	1
SG-348-3'	UST 76	850	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-349-3'	UST 76	970	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-350-3'	UST 76	750	<730	0.05	<0.04	<0.1	<0.1	<0.1
SG-351-3'	UST 76	930	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-352-3'	UST 76	610	<730	0.1	0.1	<0.1	<0.1	0.5
SG-353-3'	UST 76	840	<730	0.09	0.1	<0.1	<0.1	0.3
AIR	UST 76	930	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-354-3'	UST 76	680	<730	0.06	<0.04	<0.1	<0.1	0.2
SG-355-3'	UST 76	860	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-356-3'	UST 76	790	<730	0.09	0.2	<0.1	<0.1	1
SG-357-3'	UST 76	1200	<730	0.8	0.6	<0.1	<0.1	4
SG-358-3'	UST 76	1000	<730	0.09	0.2	<0.1	<0.1	0.9
SG-359-3'	UST 76	1000	<730	0.09	0.1	<0.1	<0.1	0.5
SG-360-3'	UST 76	1000	<730	0.1	0.1	<0.1	<0.1	0.6
SG-361-3'	UST 76	2500	<730	1	1	0.5	<0.1	6
SG-362-3'	UST 76	920	<730	<0.02	<0.04	<0.1	<0.1	<0.1
SG-363-3'	UST 76	850	<730	<0.02	<0.04	<0.1	<0.1	<0.1
AIR	UST 76	1300	<730	<0.02	<0.04	<0.1	<0.1	<0.1

UST-IR
D-44

Analyzed by: C. Poff
Proofed by: MM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/04/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 80	1400	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-364-3'	UST 80	1300	<670	0.4	0.4	<0.2	<0.3	2
SG-365-3'	UST 80	830	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-366-3'	UST 80	670	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-367-3'	UST 80	780	<670	0.08	0.2	<0.2	<0.3	0.3
SG-368-3'	UST 80	800	<670	0.05	0.1	<0.2	<0.3	<0.3
SG-369-3'	UST 80	650	<670	0.07	0.2	<0.2	<0.3	0.5
SG-370-3'	UST 80	530	<670	0.05	<0.1	<0.2	<0.3	<0.3
SG-371-3'	UST 80	870	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-372-3'	UST 80	770	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-373-3'	UST 80	840	<670	<0.04	<0.1	<0.2	<0.3	<0.3
AIR	UST 80	1000	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-374-3'	UST 80	760	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-375-3'	UST 80	710	<670	<0.04	<0.1	<0.2	<0.3	<0.3
SG-376-3'	UST 80	940	<670	0.08	0.2	<0.2	<0.3	0.5
SG-377-3'	UST 80	750	<670	0.04	<0.1	<0.2	<0.3	<0.3
SG-378-3'	UST 80	830	<670	0.05	<0.1	<0.2	<0.3	<0.3
SG-379-3'	UST 80	800	<670	0.2	0.3	<0.2	<0.3	1
SG-380-3'	UST 80	770	<670	0.04	<0.1	<0.2	<0.3	<0.3
SG-381-3'	UST 80	700	<670	0.04	<0.1	<0.2	<0.3	<0.3
SG-382-3'	UST 80	460	<670	0.1	0.2	<0.2	<0.3	1
SG-383-3'	UST 80	800	<670	0.06	<0.1	<0.2	<0.3	<0.3
AIR	UST 80	950	<670	<0.04	<0.1	<0.2	<0.3	<0.3

UST-IR
D-45

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/05/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 84	1400	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-384-3'	UST 84	680	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-385-3'	UST 84	530	<750	0.06	<0.08	<0.2	<0.3	0.3
SG-386-3'	UST 84	1000	<750	0.09	0.1	<0.2	<0.3	0.4
SG-387-3'	UST 84	1000	<750	0.3	0.4	<0.2	<0.3	2
SG-388-3'	UST 84	790	<750	0.4	0.3	<0.2	<0.3	2
AIR	UST 84	1200	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-389-3'	UST 84	860	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-390-3'	UST 84	760	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-391-3'	UST 84	560	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-392-3'	UST 84	730	<750	<0.04	<0.08	<0.2	<0.3	<0.3
SG-393-3'	UST 84	780	<750	0.06	<0.08	<0.2	<0.3	<0.3
SG-394-3'	UST 84	790	<750	<0.04	<0.08	<0.2	<0.3	7
SG-395-3'	UST 84	750	<750	<0.04	<0.08	<0.2	<0.3	2
SG-396-3'	UST 84	850	<750	0.07	<0.08	<0.2	<0.3	1
SG-397-3'	UST 84	940	<750	0.07	<0.08	<0.2	<0.3	<0.3
SG-398-3'	UST 84	1000	<750	0.05	<0.08	<0.2	<0.3	0.5
AIR	UST 84	1700	<750	<0.04	<0.08	<0.2	<0.3	<0.3

UST-IR
D-46

Analyzed by: C. Poff
Proofed by: BM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/06/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 84	2500	<730	<0.04	<0.1	<0.2	<0.3	<0.4
SG-399-3'	UST 84	730	<730	0.08	0.3	<0.2	<0.3	0.7
SG-400-3'	UST 84	900	<730	0.3	0.2	<0.2	<0.3	1
SG-401-3'	UST 84	1100	<730	0.1	<0.1	<0.2	<0.3	0.9
SG-402-3'	73	1000	<730	0.1	0.1	<0.2	<0.3	0.8
SG-403-3'	73	710	<730	0.05	<0.1	<0.2	<0.3	<0.4
SG-404-3'	73	870	<730	0.1	<0.1	<0.2	<0.3	<0.4
SG-405-3'	73	530	<730	<0.04	<0.1	<0.2	<0.3	<0.4
SG-406-3'	73	1000	<730	0.1	0.2	<0.2	<0.3	0.6
SG-407-3'	73	900	<730	0.5	0.5	<0.2	<0.3	3
AIR	73	1200	<730	<0.04	<0.1	<0.2	<0.3	<0.4

UST-IR
D-47

Analyzed by: C. Poff
Proofed by: KM

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMATILLA ARMY DEPOT/UMATILLA, OREGON/1-92-763-S
11/09/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	73	1100	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-408-3'	73	730	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-409-3'	73	700	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-410-3'	73	680	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-411-3'	UST 79	840	<840	0.06	<0.09	<0.2	<0.4	0.6
SG-412-3'	UST 79	980	<840	0.1	0.1	<0.2	<0.4	0.7
SG-413-3'	UST 79	1000	<840	0.1	0.1	<0.2	<0.4	0.6
SG-414-3'	UST 79	1000	<840	0.1	0.09	<0.2	<0.4	0.8
SG-415-3'	UST 79	820	<840	0.06	<0.09	<0.2	<0.4	<0.4
SG-416-3'	UST 79	1100	<840	0.2	<0.09	<0.2	<0.4	1
SG-417-3'	UST 79	840	<840	<0.04	<0.09	<0.2	<0.4	<0.4
AIR	UST 79	820	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-418-3'	UST 79	1300	<840	0.1	<0.09	<0.2	<0.4	0.7
SG-419-3'	UST 79	920	<840	0.1	0.2	<0.2	<0.4	0.8
SG-420-3'	UST 79	690	<840	0.05	<0.09	<0.2	<0.4	<0.4
SG-421-3'	UST 79	970	<840	0.1	<0.09	<0.2	<0.4	0.7
SG-422-3'	UST 79	2200	<840	0.6	0.5	<0.2	<0.4	3
SG-423-3'	UST 79	950	<840	0.6	0.5	<0.2	<0.4	3
SG-424-3'	UST 79	670	<840	<0.04	<0.09	<0.2	<0.4	<0.4
SG-425-3'	UST 79	1800	<840	1	1	<0.2	<0.4	5
SG-426-3'	UST 79	2700	<840	<0.04	<0.09	<0.2	<0.4	<0.4
AIR	UST 79	980	<840	<0.04	<0.09	<0.2	<0.4	<0.4

UST-IR
D-48

Analyzed by: C. Poff
Proofed by: KM

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/10/92

SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 100	990	<820	<0.04	<0.1	<0.3	<0.4	<0.4
SG-427-3'	UST 100	5600	<820	<0.04	<0.1	<0.3	<0.4	<0.4
SG-428-3'	UST 100	8900	<820	<0.04	<0.1	<0.3	<0.4	1
SG-429-3'	UST 100	10000	<820	0.06	<0.1	<0.3	<0.4	<0.4
SG-430-3'	UST 100	6400	<820	0.2	<0.1	<0.3	<0.4	2
SG-431-3'	UST 100	8500	<820	<0.4	<0.3	<1	2	26
SG-432-3'	UST 100	2300	<820	<0.04	<0.6	<2	2	20
SG-433-3'	UST 100	2800	<820	<0.04	<0.5	<0.9	1	12
SG-434-3'	UST 100	1900	<820	0.04	<0.1	<0.3	<0.4	0.6
SG-435-3'	UST 100	5600	<820	0.08	<0.1	<0.3	<0.4	<0.4
SG-436-3'	UST 100	6200	<820	<0.04	<0.1	<0.3	<0.4	<0.4
AIR	UST 82	1100	<820	<0.04	<0.1	<0.3	<0.4	<0.4
SG-437-3'	UST 82	3700	<820	0.3	0.5	<0.3	<0.4	2
SG-438-3'	UST 82	3800	<820	0.06	<0.1	<0.3	<0.4	<0.4
SG-439-3'	UST 102	980	<820	<0.04	20	<0.3	<0.4	60
SG-440-3'	UST 102	1200	<820	0.09	0.8	<0.3	<0.4	2
SG-441-3'	UST 102	1700	<820	0.1	<0.1	<0.3	<0.4	<0.4
SG-442-3'	UST 102	1400	<820	0.1	0.1	<0.3	<0.4	0.8
SG-443-3'	UST 102	1100	<820	<0.04	2	<0.3	<0.4	3
AIR	UST 102	1000	<820	<0.04	<0.1	<0.3	<0.4	<0.4

UST-IR
D-49

Analyzed by: C. Poff
Proofed by: KM

Tracer Research Corporation

TRACER RESEARCH CORPORATION-ANALYTICAL RESULTS
DAMES & MOORE/UMDA/HERMISTON, OREGON/1-92-763-S
11/11/92

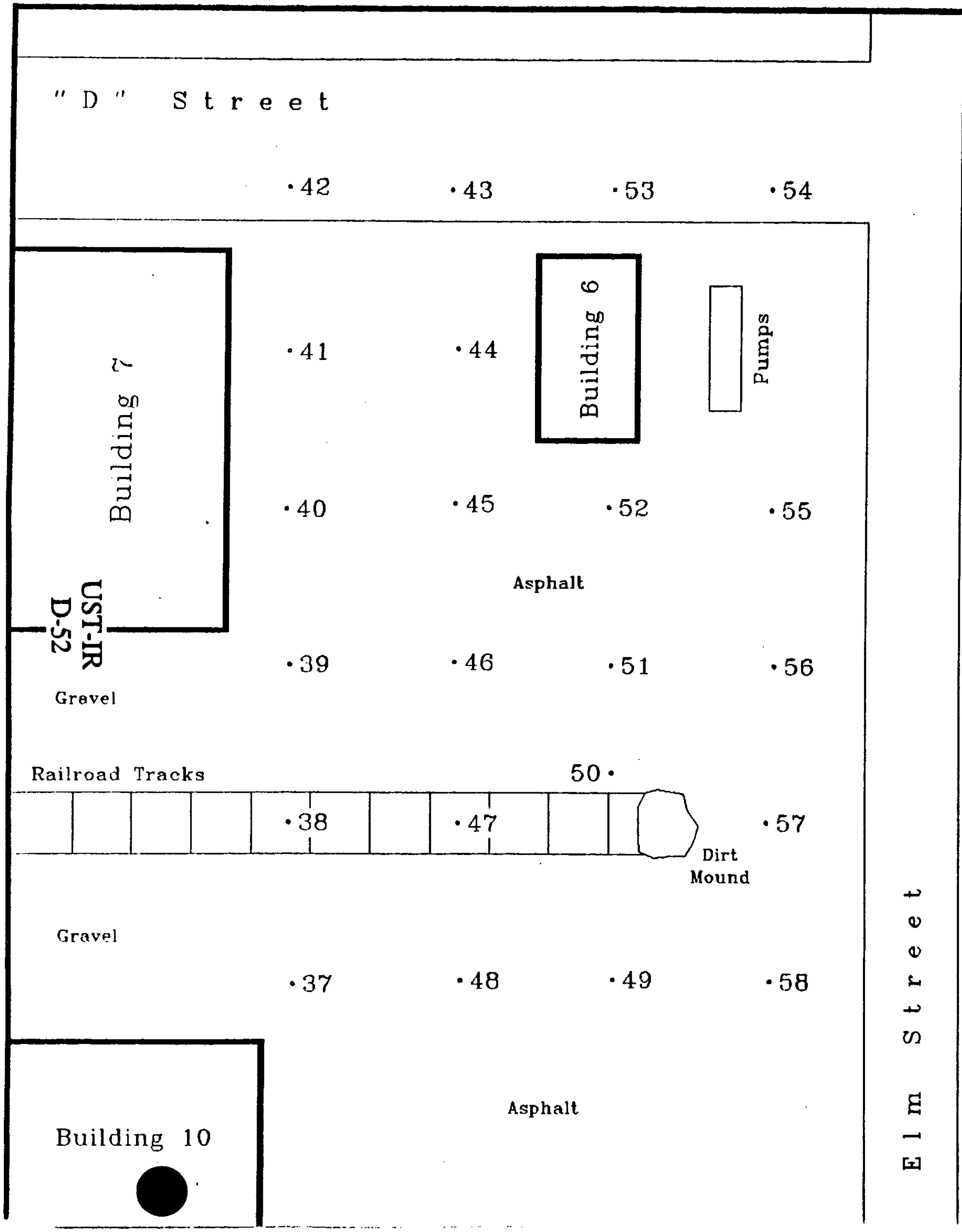
SAMPLE	SITE	CO2 ug/l	CH4 ug/l	BENZENE ug/l	TOLUENE ug/l	ETHYL BENZENE ug/l	XYLENES ug/l	TVHC ug/l
AIR	UST 100	940	<790	<0.04	<0.1	<0.3	<0.4	<0.4
SG-444-3'	UST 100	6200	<790	<2	<5	<1	<2	110
SG-445-3'	UST 100	2500	<790	<0.04	<0.1	<0.3	<0.4	<0.4
SG-446-3'	UST 100	1200	<790	0.6	0.4	<0.3	<0.4	3
SG-447-3'	UST 100	1800	<790	0.06	<0.1	<0.3	<0.4	<0.4
SG-448-3'	UST 100	2400	<790	0.06	<0.1	<0.3	<0.4	0.6
AIR	UST 100	1300	<790	<0.04	<0.1	<0.3	<0.4	<0.4
SG-449-3'	UST 100	2400	<790	0.08	<0.1	<0.3	<0.4	<0.4
SG-450-3'	UST 102	1300	<790	<0.04	<0.1	<0.3	<0.4	<0.4
SG-451-3'	UST 102	1900	<790	0.2	0.2	<0.3	<0.4	2
SG-452-3'	UST 102	1200	<790	0.08	<0.1	<0.3	<0.4	0.6
SG-453-3'	UST 102	1100	<790	0.2	0.2	<0.3	<0.4	1
SG-454-3'	UST 100	2300	<790	0.7	0.5	<0.3	<0.4	4
SG-455-3'	UST 100	1100	<790	0.1	<0.1	<0.3	<0.4	0.4
AIR	UST 100	1200	<790	<0.04	<0.1	<0.3	<0.4	<0.4

UST-IR
D-50

Analyzed by: C. Poff
Proofed by: ~~~~~~~~~~~~~

APPENDIX B Figures

Tracer Research Corporation



EXPLANATION

•37 Sampling Probe Location

N

0 25
feet

1-92-763-S

UMATILLA DEPOT ACTIVITY

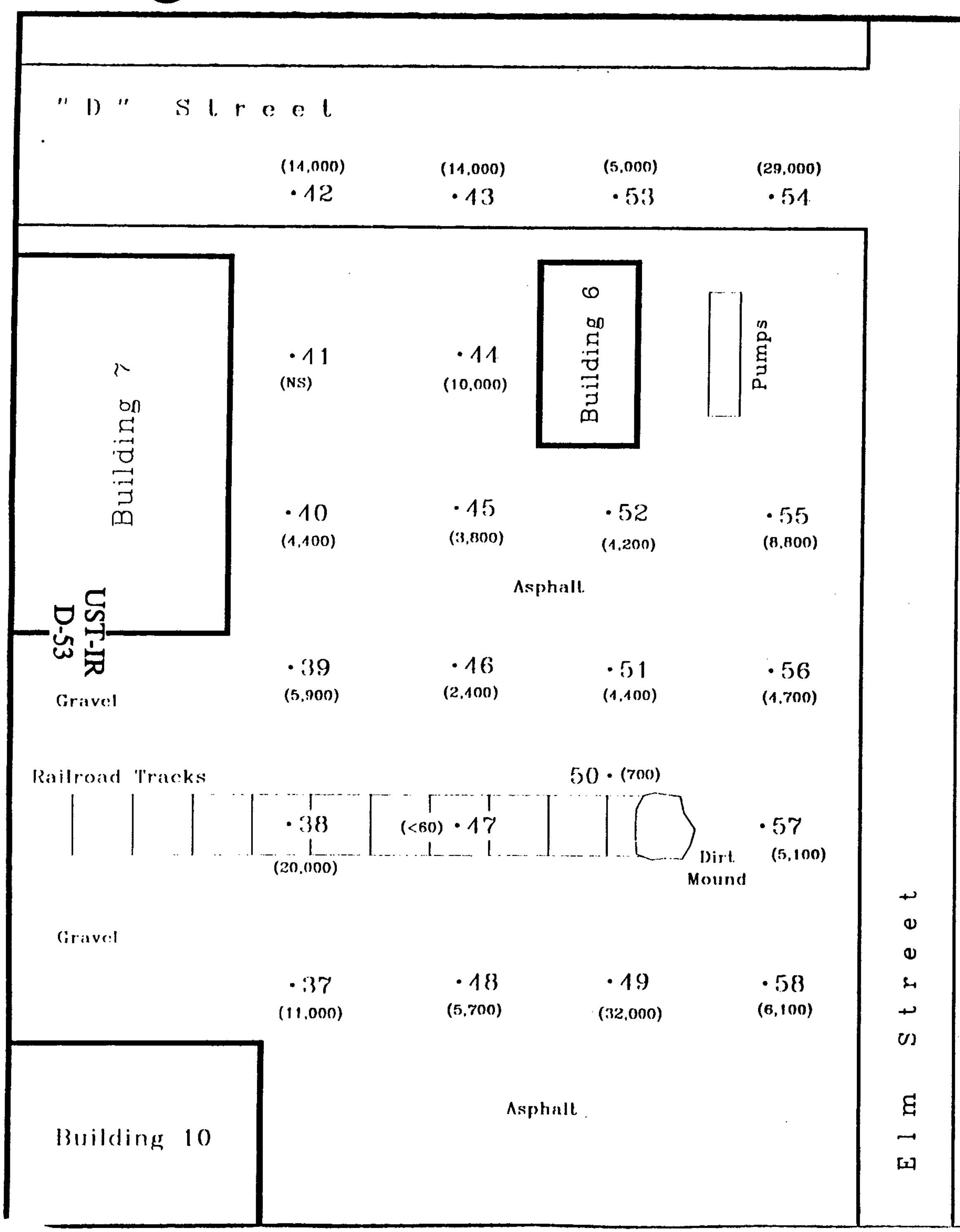
SITE No. 42 East

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 1a

Tracer Research Corporation



EXPLANATION

•37 Sampling Probe Location

(60) CO2 Detection Limits (µg/L)

(180)-M Methane Detection Limits (µg/L)

(NS) No Sample

Note: Only concentrations greater than detection limits are shown.

N

0 25 feet

1-92-763-S

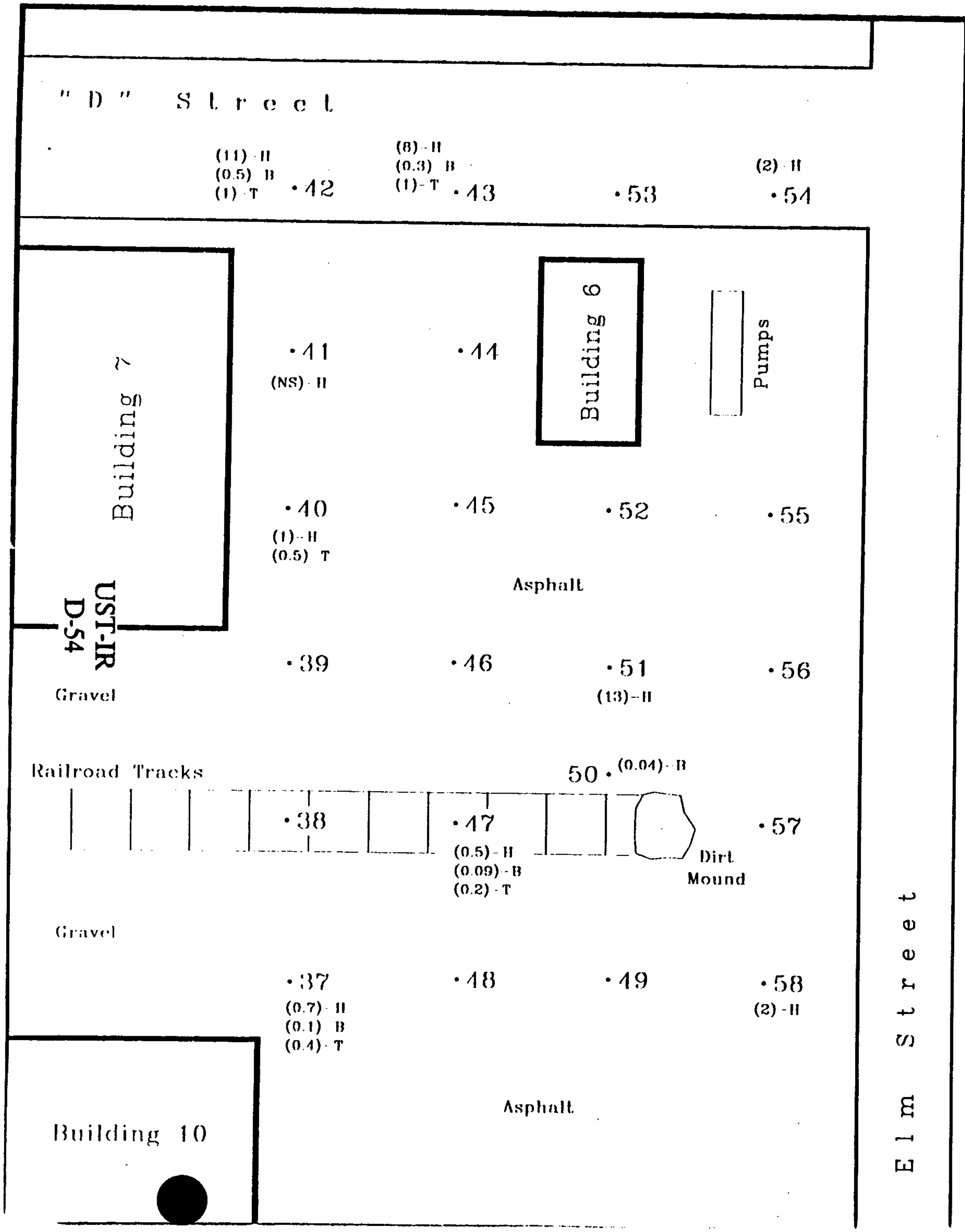
UMATILLA DEPOT ACTIVITY

SITE No. 42 East

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 1b



Tracer Research Corporation

EXPLANATION

•37	Sampling Probe Location
(0.4)-H	TVHC Detection Limits (µg/L)
(0.04)-B	Benzene Detection Limits (µg/L)
(0.1)-T	Toluene Detection Limits (µg/L)
(0.3)-E	Ethylbenzene Detection Limits (µg/L)
(0.4)-X	Xylenes Detection Limits (µg/L)
(NS)	No Sample

Note: Only concentrations greater than detection limits are shown.

N

0 25
feet

1-92-763-S

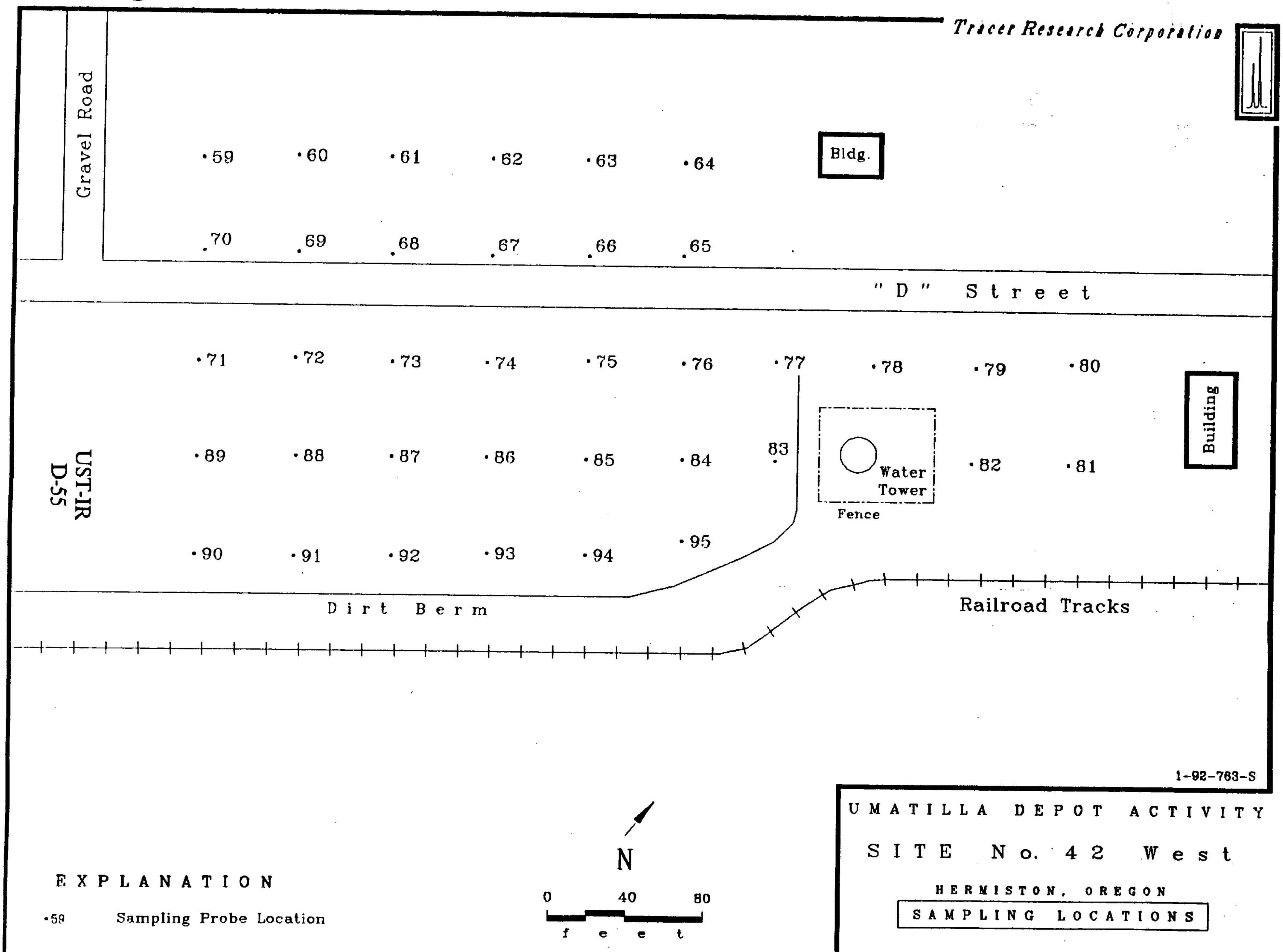
UMATILLA DEPOT ACTIVITY

SITE No. 42 East

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLEN

Figure 1c



UMATILLA DEPOT ACTIVITY

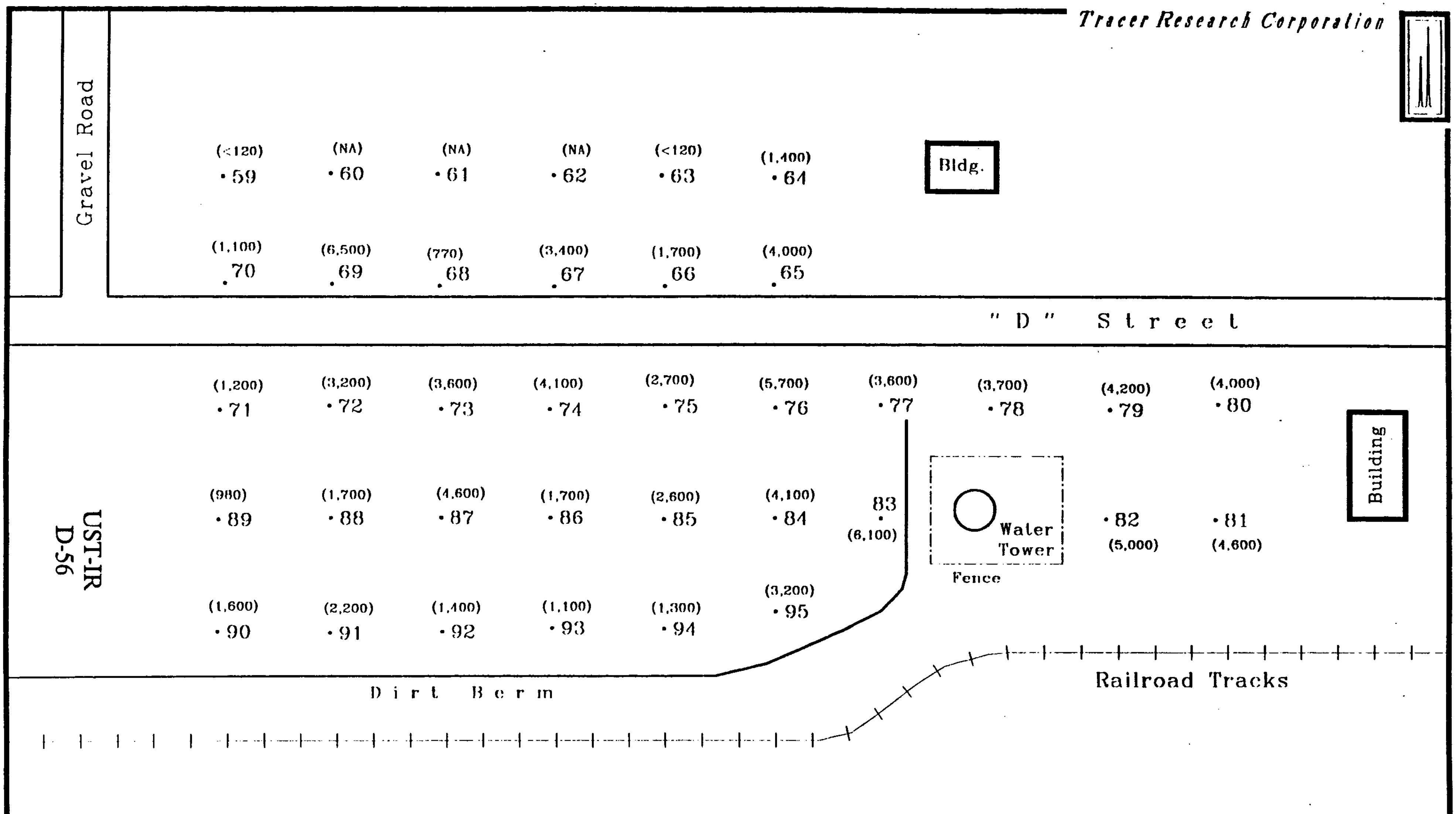
SITE No. 42 West

HERMISTON, OREGON

SAMPLING LOCATIONS

EXPLANATION

•59 Sampling Probe Location



EXPLANATION

•59	Sampling Probe Location
(58)	CO2 Detection Limits (µg/L)
(160) M	Methane Detection Limits (µg/L)
(NA)	Not Analyzed

Note: Only concentrations greater than the detection limits are shown.

1-92 763-S

UMATILLA DEPOT ACTIVITY

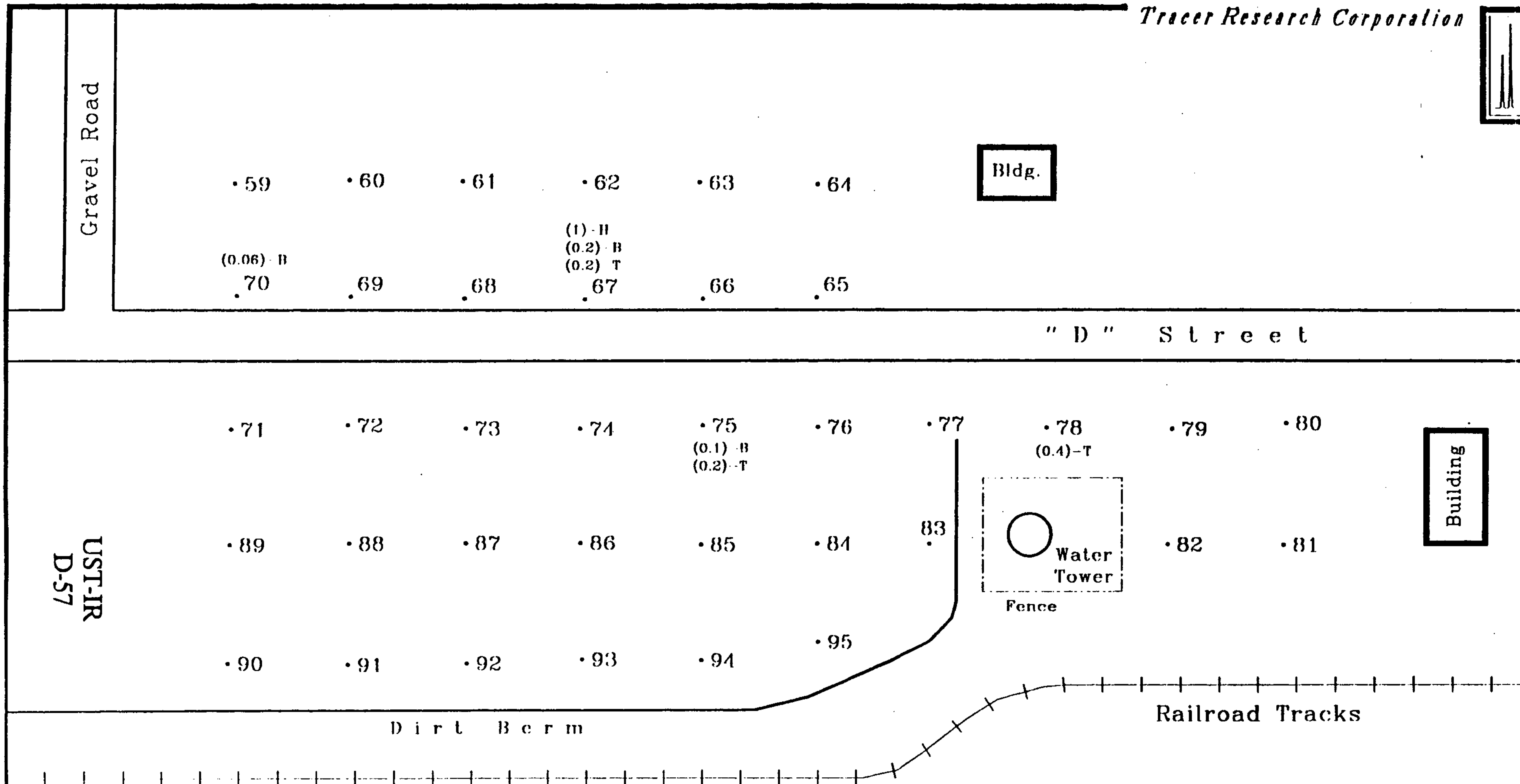
SITE No. 42 West

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 2b

Tracer Research Corporation



UST-IR
D-57

EXPLANATION

•59	Sampling Probe Location
(0.4) H	TVHC Detection Limits (µg/L)
(0.04) B	Benzene Detection Limits (µg/L)
(0.1) T	Toluene Detection Limits (µg/L)
(0.2) E	Ethylbenzene Detection Limits (µg/L)
(0.4) X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

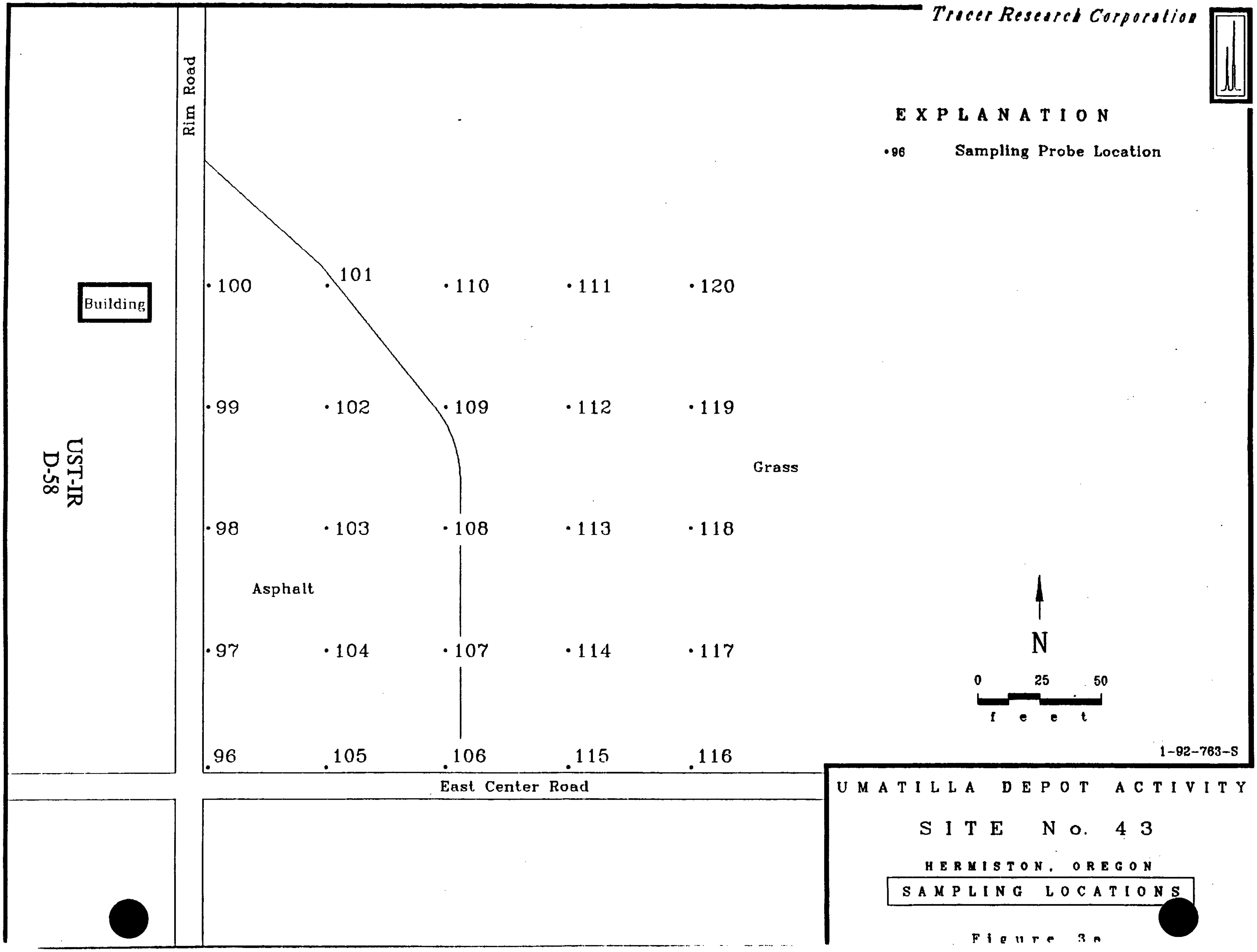
UMATILLA DEPOT ACTIVITY

SITE No. 42 West

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 2c



UMATILLA DEPOT ACTIVITY

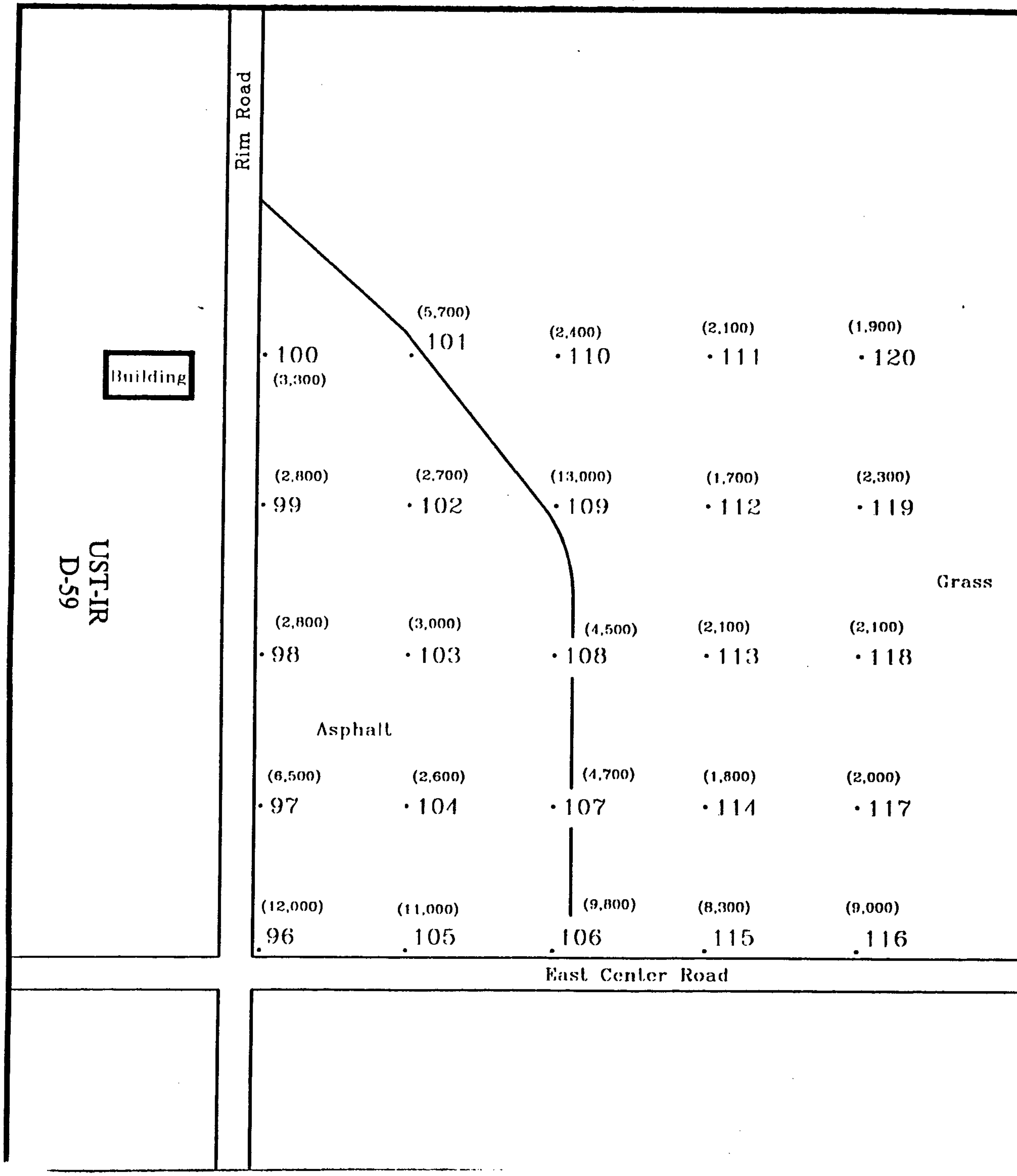
SITE No. 43

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 3a

Tracer Research Corporation



EXPLANATION

•96	Sampling Probe Location
(280)	CO2 Detection Limits (µg/L)
(830)-M	Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92 763-S

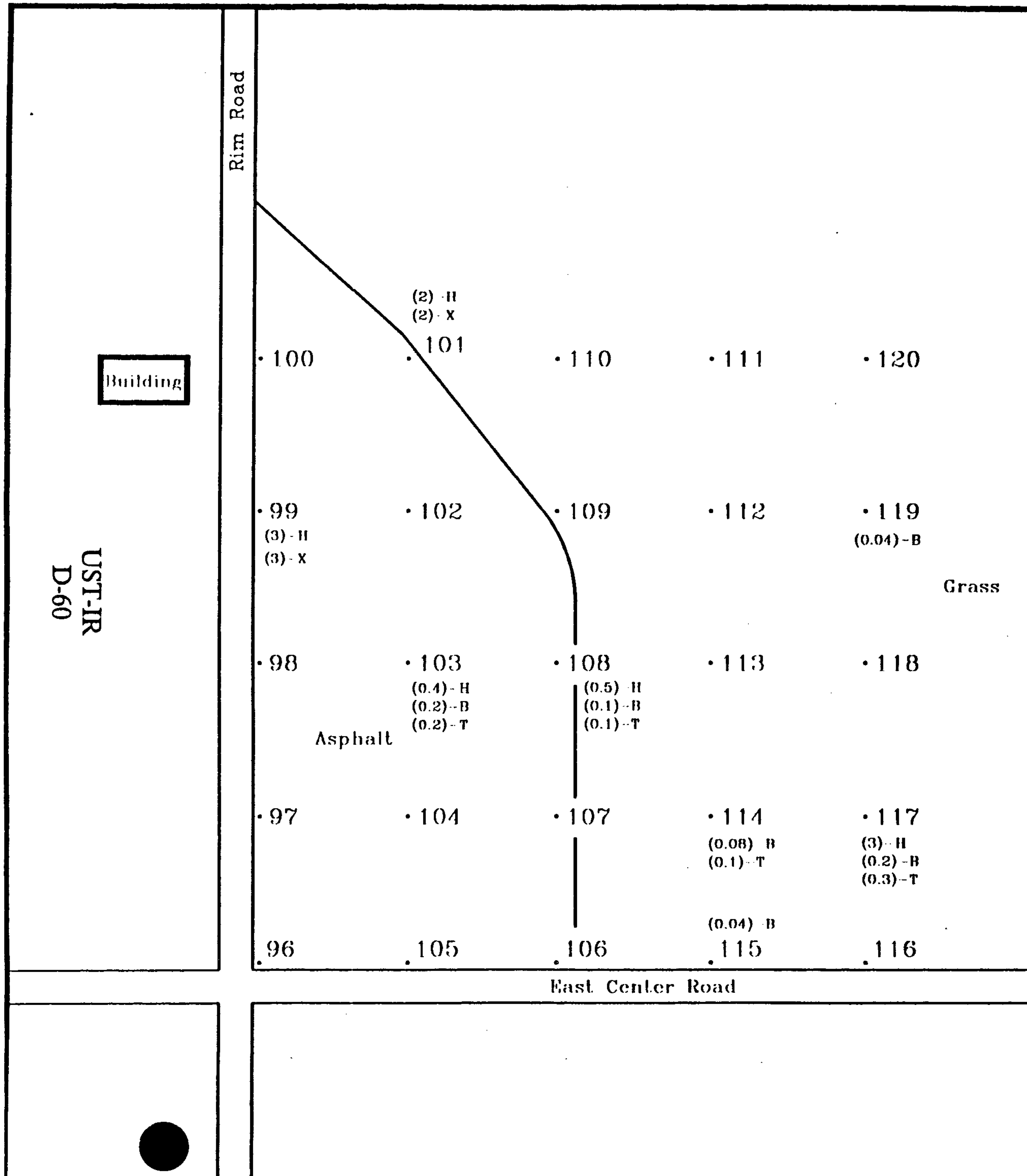
UMATILLA DEPOT ACTIVITY

SITE No. 43

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 3b



Tracer Research Corporation

E X P L A N A T I O N

•96	Sampling Probe Location
(0.3) - H	TVHC Detection Limits (µg/L)
(0.009) - B	Benzene Detection Limits (µg/L)
(0.1) - T	Toluene Detection Limits (µg/L)
(0.3) - E	Ethylbenzene Detection Limits (µg/L)
(0.3) - X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 25 50
feet

1-92-763-S

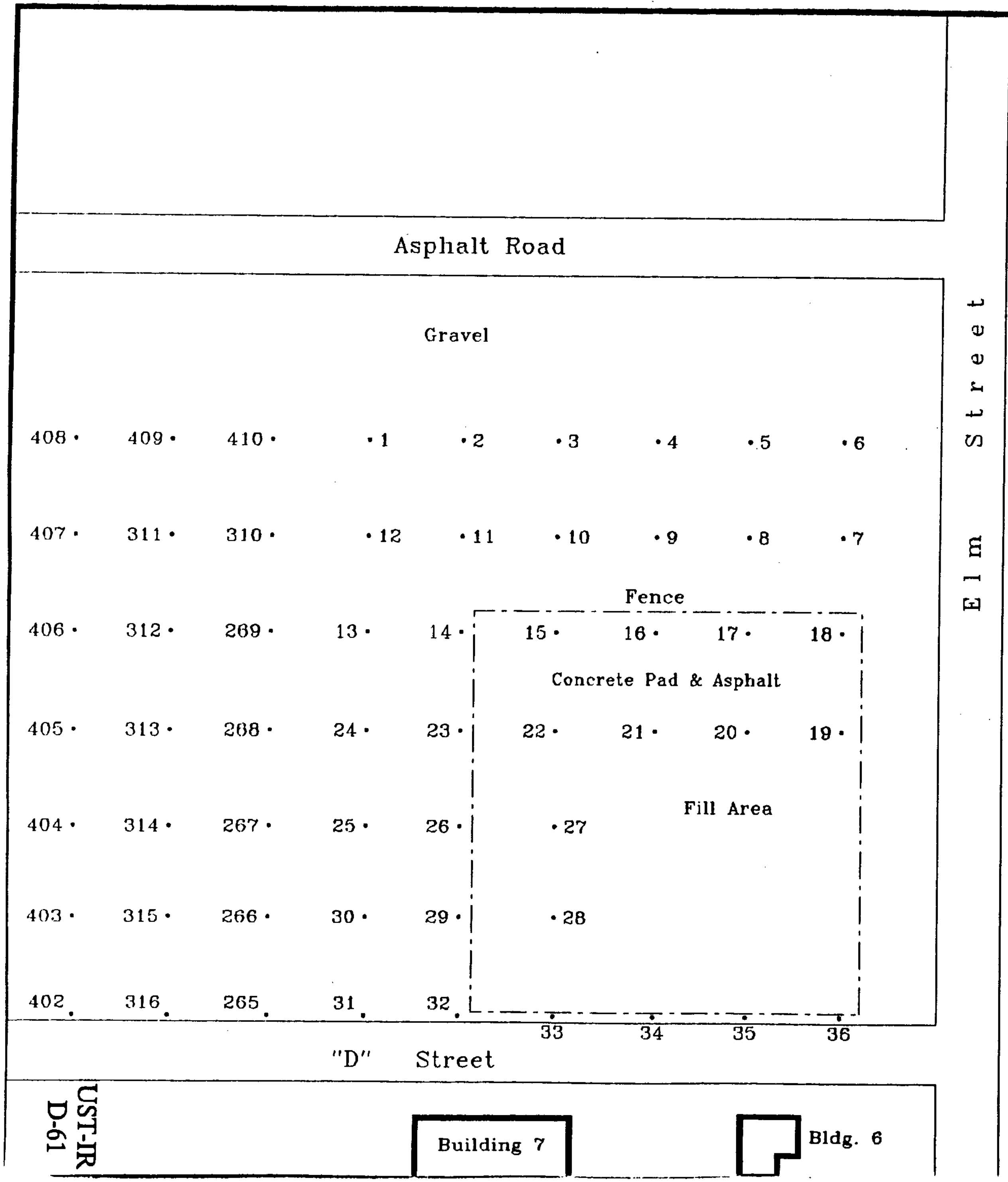
U M A T I L L A D E P O T A C T I V I T Y

S I T E No. 4 3

H E R M I S T O N , O R E G O N

T V H C , B E N Z E N E , T O L U E N E
E T H Y L B E N Z E N E , X Y L E

Figure 3c



EXPLANATION

•1 Sampling Probe Location

N

0 25 50
feet

1-92-763-S

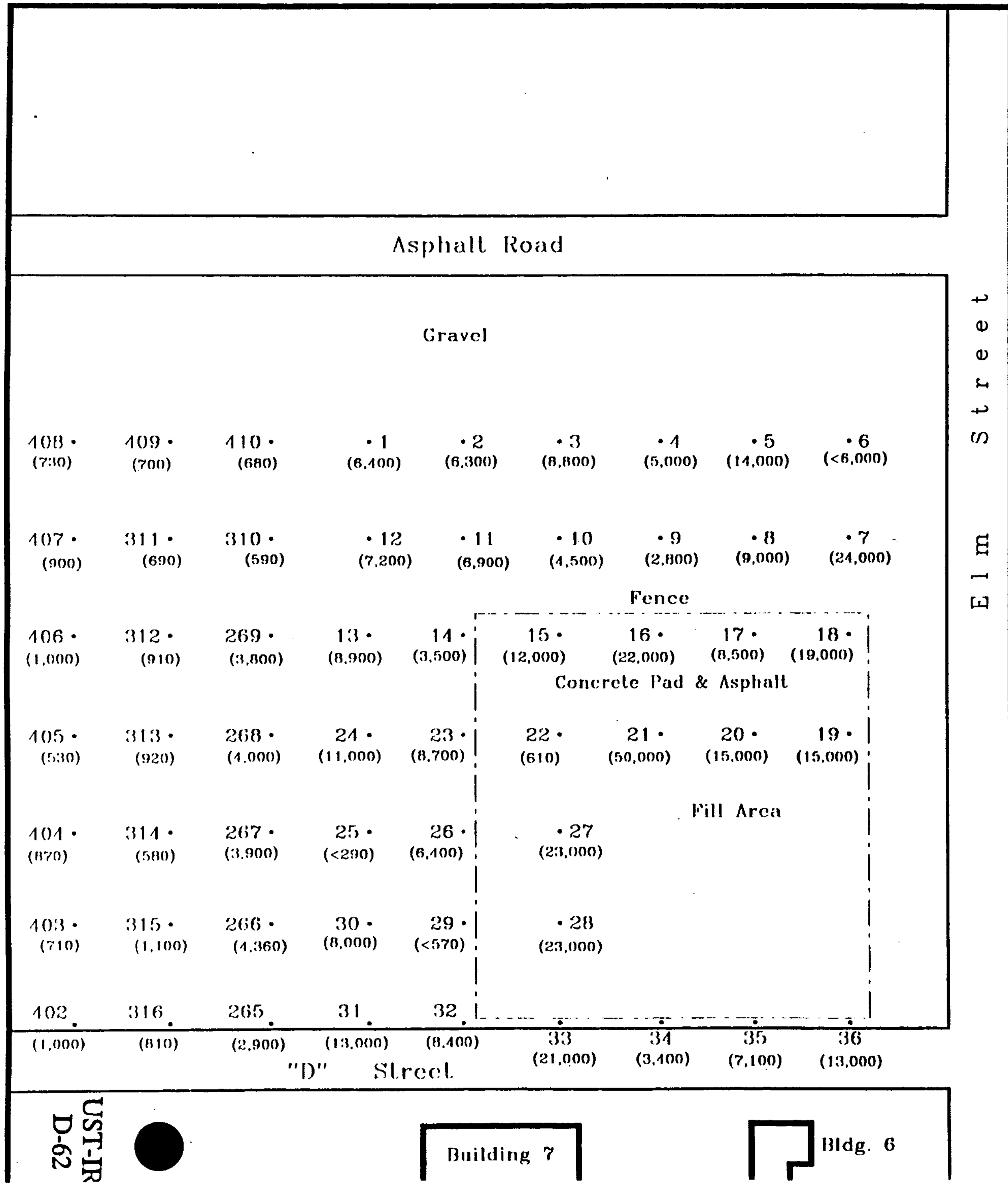
UMATILLA DEPOT ACTIVITY

SITE No. 73

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 4a



UST-IR
D-62

Tracer Research Corporation

EXPLANATION

•1	Sampling Probe Location
(57)	CO2 Detection Limits (µg/L)
(42)-M	Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 25 50
feet

1-92-763-S

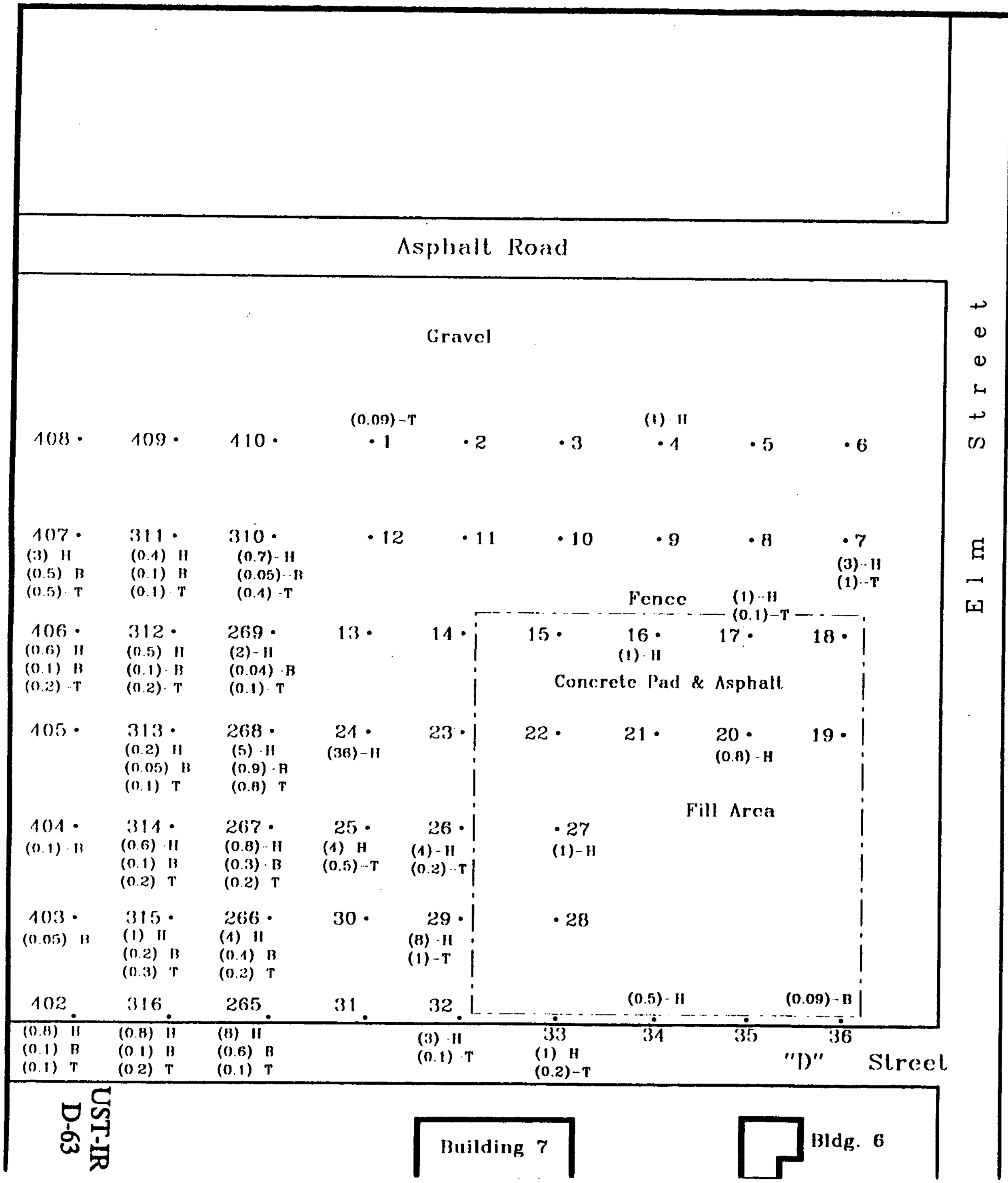
UMATILLA DEPOT ACTIVITY

SITE No. 73

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 4b



Tracer Research Corporation

EXPLANATION

•1	Sampling Probe Location
(0.1)-H	TVHC Detection Limits (µg/L)
(0.02)-B	Benzene Detection Limits (µg/L)
(0.04) T	Toluene Detection Limits (µg/L)
(0.09)-E	Ethylbenzene Detection Limits (µg/L)
(0.1)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

UMATILLA DEPOT ACTIVITY

SITE No. 73

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE ETHYLBENZENE, XYLENES

Figure 4c

UST-IR D-63

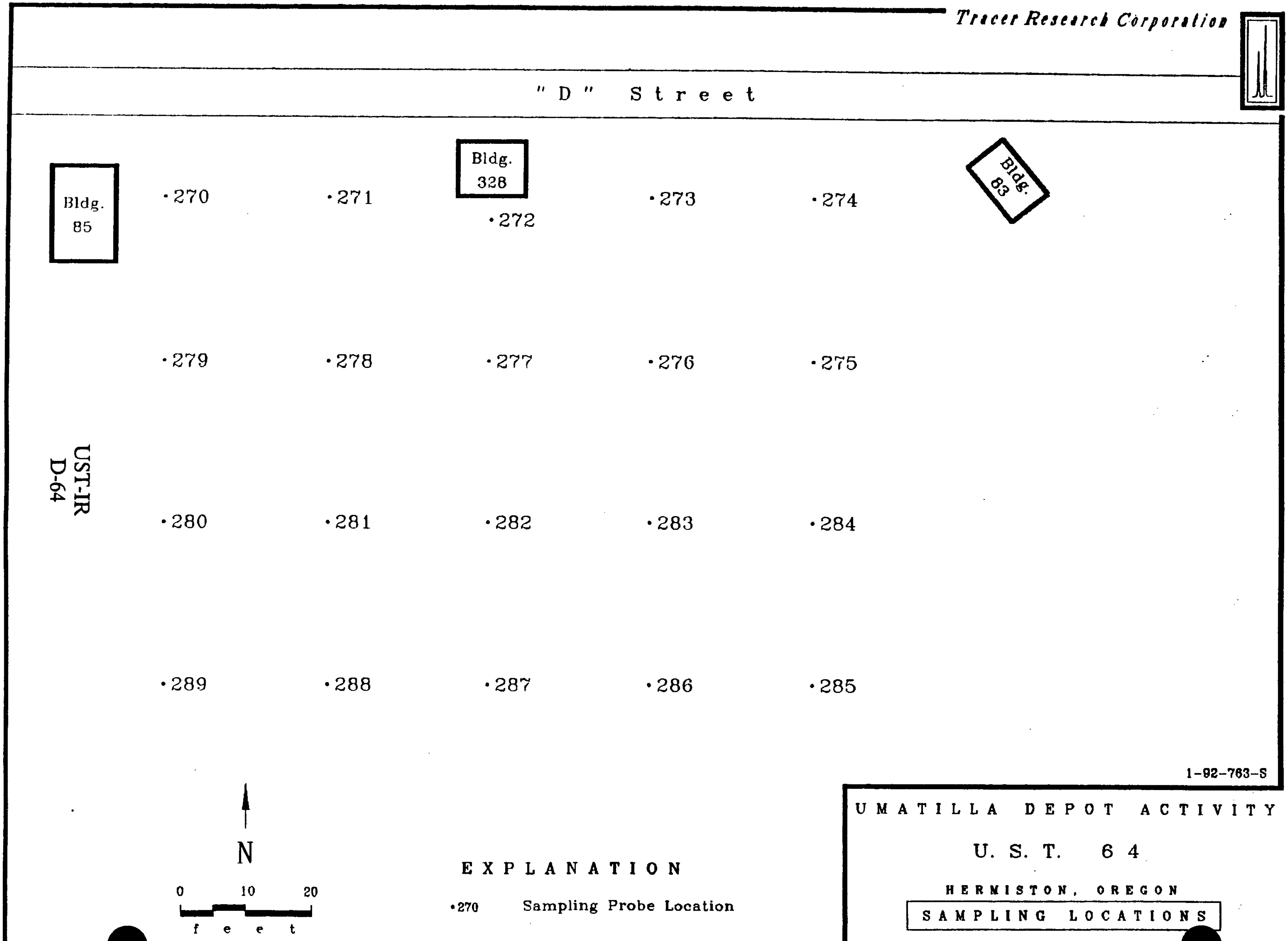
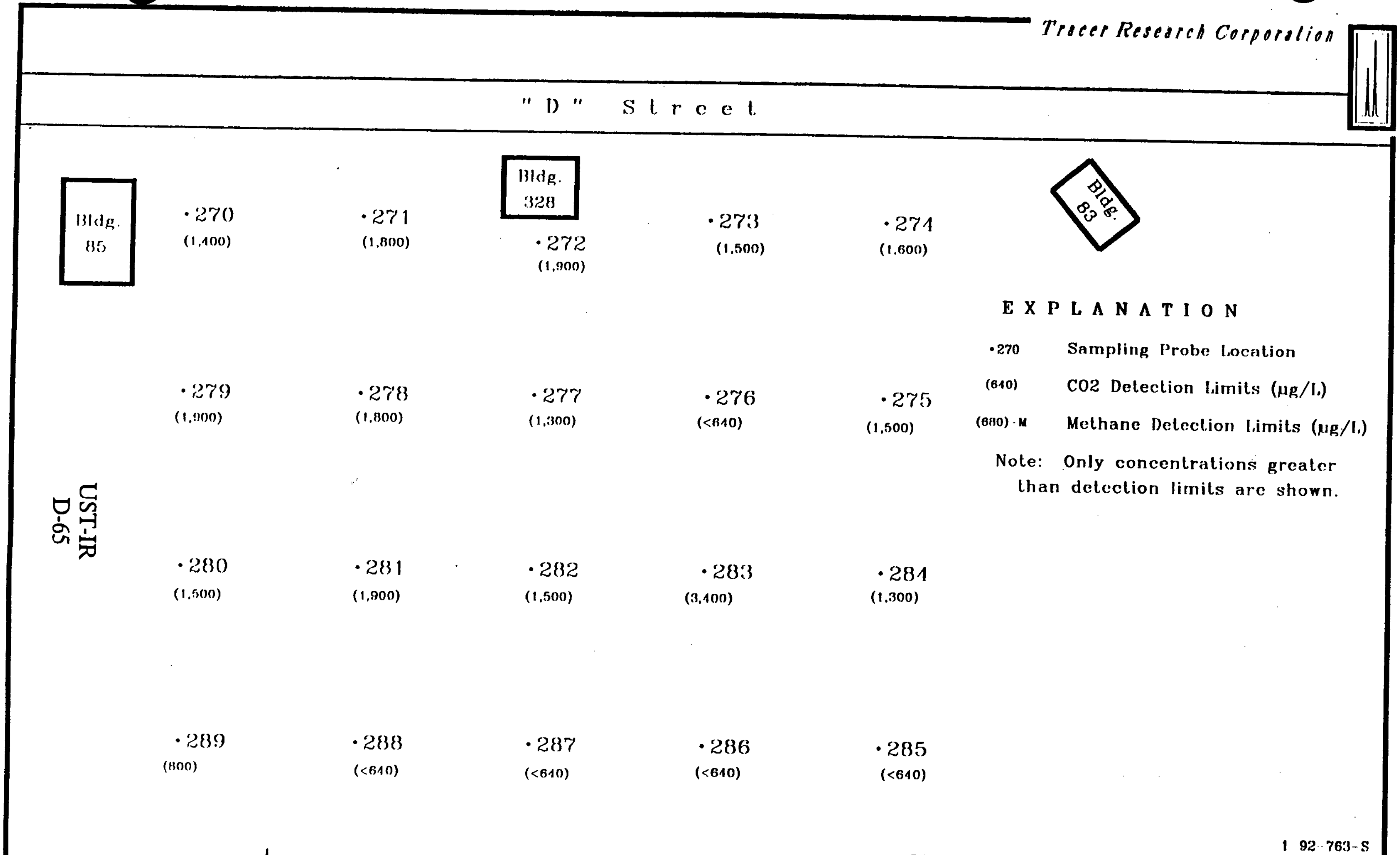


Figure 5a

UST-IR
D-64



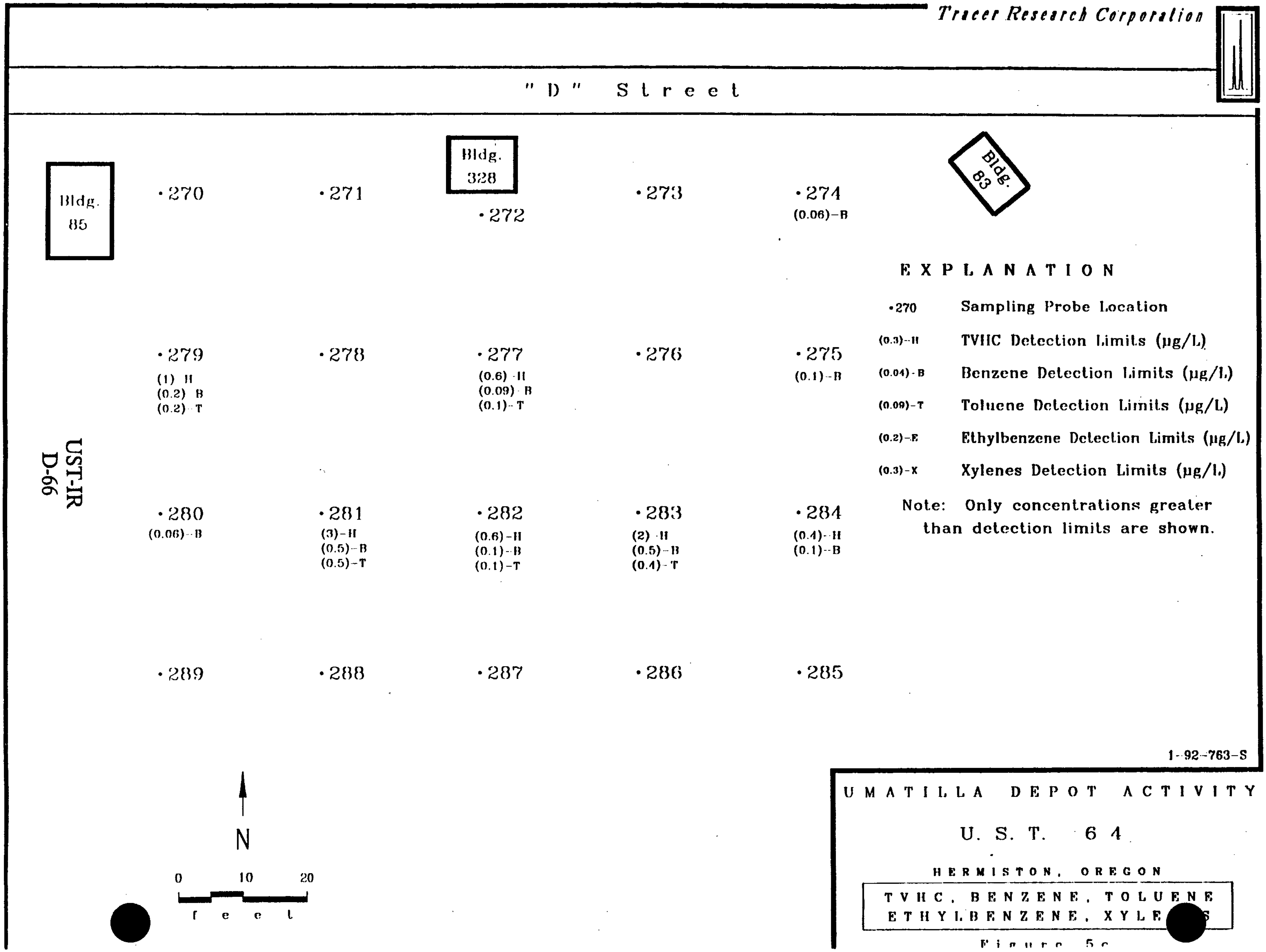
UMATILLA DEPOT ACTIVITY

U. S. T. 64

HERMISTON, OREGON

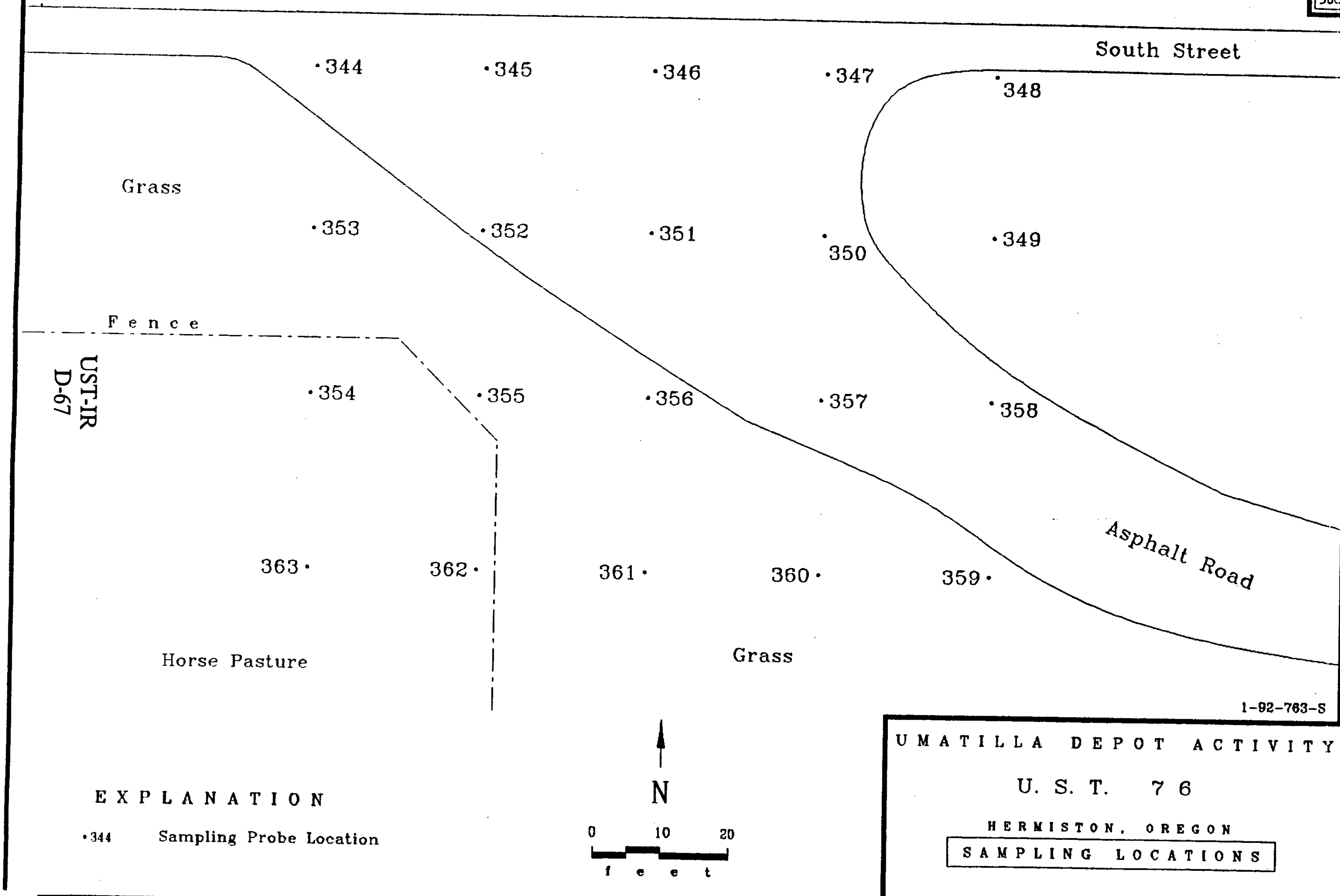
CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 5b



Tracer Research Corporation
"D" Street
Bldg. 85
Bldg. 328
Bldg. 83
•270
•271
•272
•273
•274 (0.06)–B
•279 (1)–H (0.2)–B (0.2)–T
•278
•277 (0.6)–H (0.09)–B (0.1)–T
•276
•275 (0.1)–B
•280 (0.06)–B
•281 (3)–H (0.5)–B (0.5)–T
•282 (0.6)–H (0.1)–B (0.1)–T
•283 (2)–H (0.5)–B (0.4)–T
•284 (0.4)–H (0.1)–B
•289
•288
•287
•286
•285
EXPLANATION
•270 Sampling Probe Location
(0.3)–H TVHC Detection Limits (µg/L)
(0.04)–B Benzene Detection Limits (µg/L)
(0.09)–T Toluene Detection Limits (µg/L)
(0.2)–E Ethylbenzene Detection Limits (µg/L)
(0.3)–X Xylenes Detection Limits (µg/L)
Note: Only concentrations greater than detection limits are shown.
N
0 10 20
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 64
HERMISTON, OREGON
TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLE

Tracer Research Corporation



EXPLANATION

•344 Sampling Probe Location

UST-IR
D-67

1-92-763-S

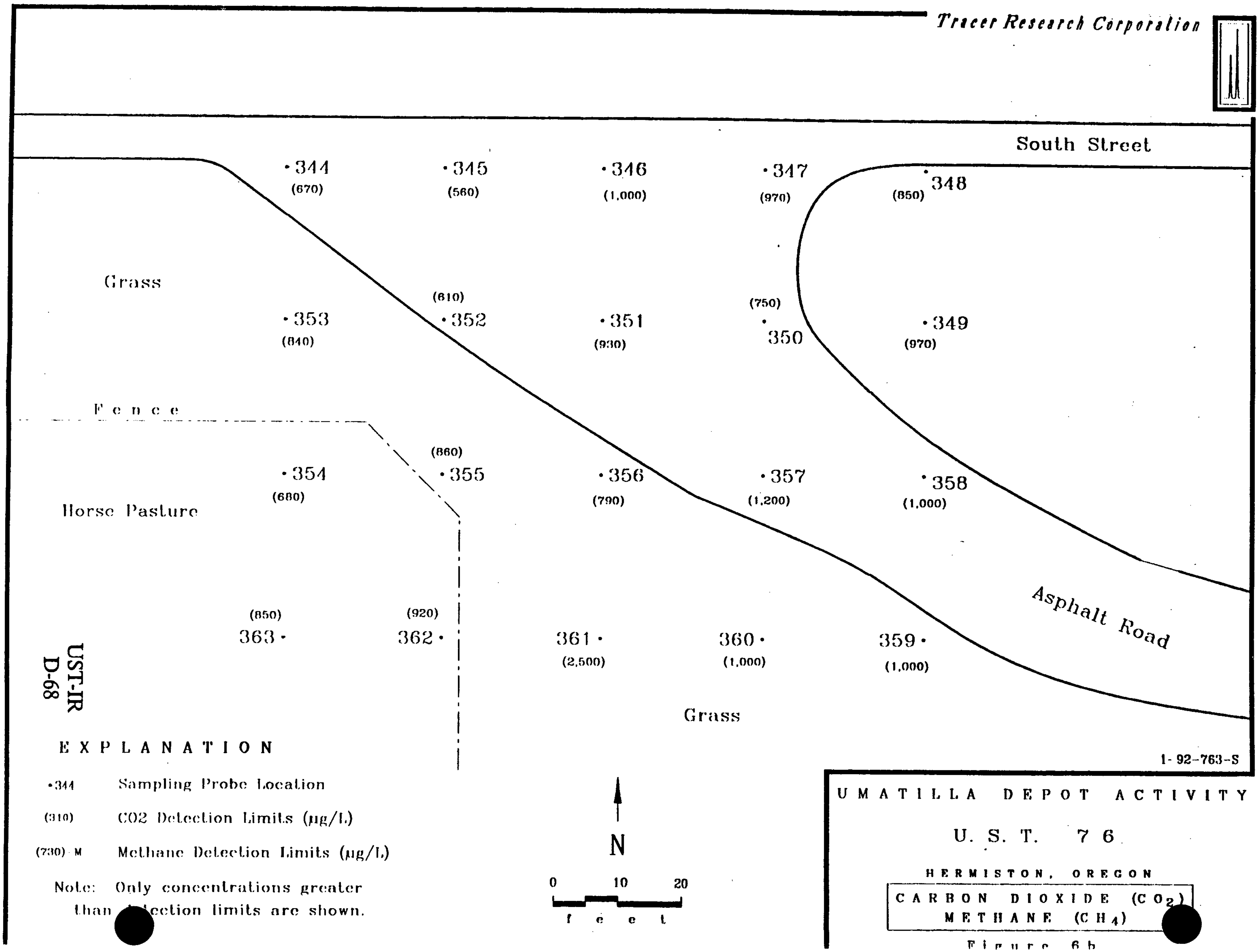
UMATILLA DEPOT ACTIVITY

U. S. T. 76

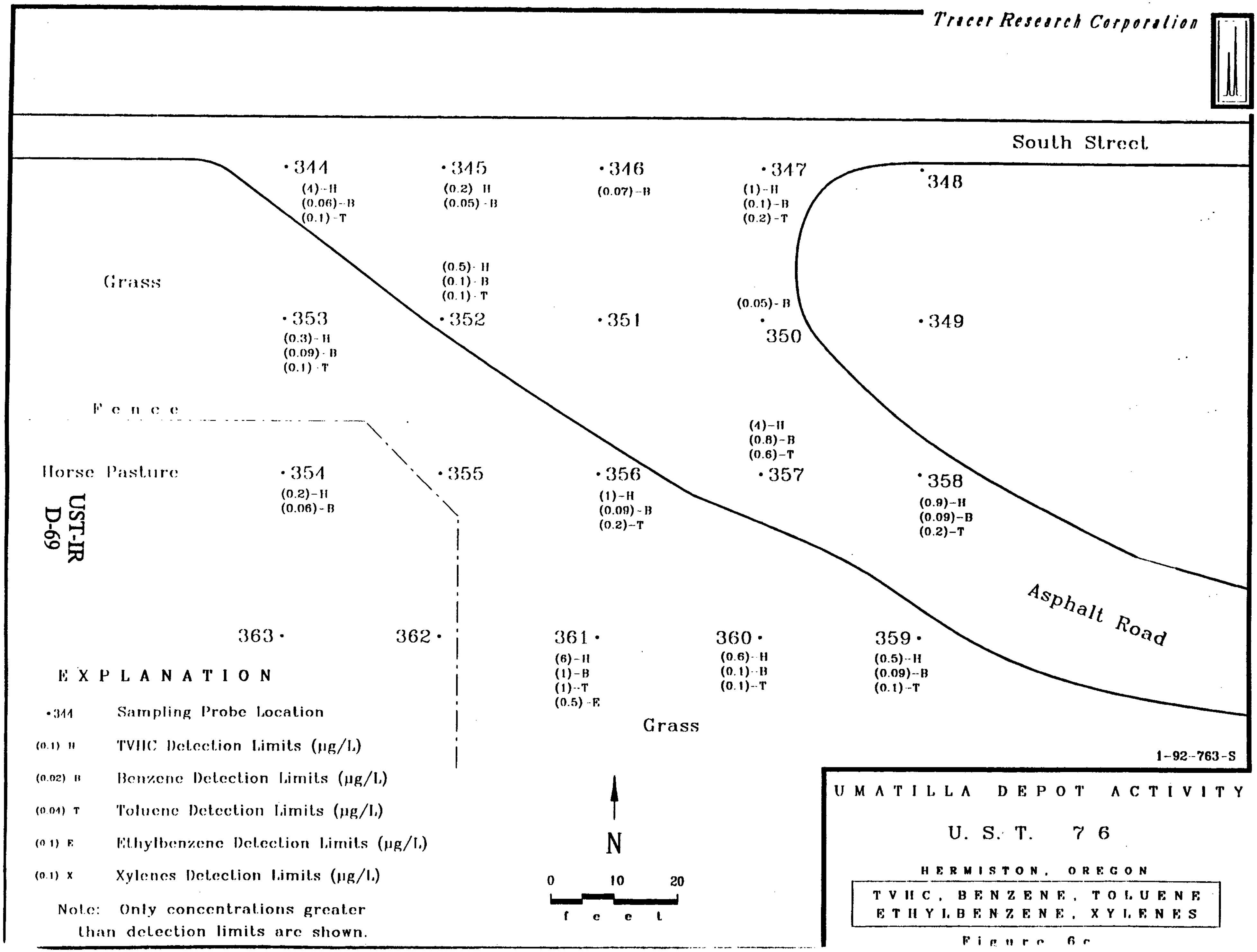
HERMISTON, OREGON

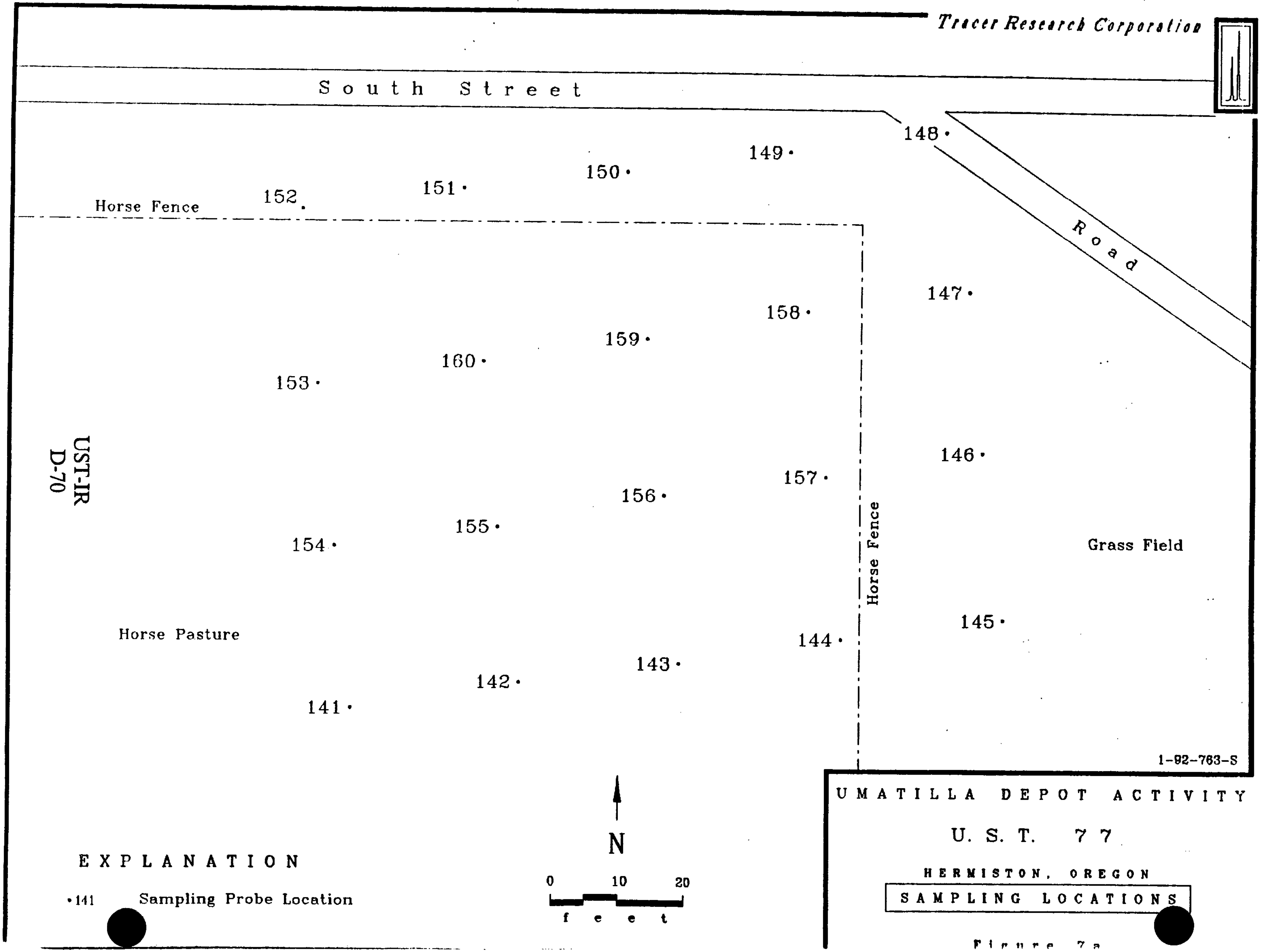
SAMPLING LOCATIONS

Figure 6a



Tracer Research Corporation
South Street
Asphalt Road
Grass
Fence
Horse Pasture
Grass
•344 (670)
•345 (560)
•346 (1,000)
•347 (970)
•348 (850)
•349 (970)
•350 (750)
•351 (930)
•352 (610)
•353 (840)
•354 (680)
•355 (860)
•356 (790)
•357 (1,200)
•358 (1,000)
359• (1,000)
360• (1,000)
361• (2,500)
362• (920)
363• (850)
UST-IR
D-68
EXPLANATION
•344 Sampling Probe Location
(310) CO2 Detection Limits (µg/L)
(730) M Methane Detection Limits (µg/L)
Note: Only concentrations greater than detection limits are shown.
N
0 10 20
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U.S.T. 76
HERMISTON, OREGON
CARBON DIOXIDE (CO2)
METHANE (CH4)
Figure 6b


Tracer Research Corporation
South Street
Asphalt Road
Grass
Fence
Horse Pasture
UST-IR
D-69
•344
(4)-H
(0.06)-B
(0.1)-T
•345
(0.2) H
(0.05)-B
•346
(0.07)-B
•347
(1)-H
(0.1)-B
(0.2)-T
•348
(0.5)-H
(0.1)-B
(0.1)-T
•352
•351
(0.05)-B
•350
•349
•353
(0.3)-H
(0.09)-B
(0.1)-T
•354
(0.2)-H
(0.06)-B
•355
•356
(1)-H
(0.09)-B
(0.2)-T
(4)-H
(0.8)-B
(0.6)-T
•357
•358
(0.9)-H
(0.09)-B
(0.2)-T
363•
362•
361•
(6)-H
(1)-B
(1)-T
(0.5)-E
360•
(0.6)-H
(0.1)-B
(0.1)-T
359•
(0.5)-H
(0.09)-B
(0.1)-T
Grass
EXPLANATION
•344 Sampling Probe Location
(0.1) H TVHC Detection Limits (µg/L)
(0.02) B Benzene Detection Limits (µg/L)
(0.04) T Toluene Detection Limits (µg/L)
(0.1) E Ethylbenzene Detection Limits (µg/L)
(0.1) X Xylenes Detection Limits (µg/L)
Note: Only concentrations greater than detection limits are shown.
N
0 10 20
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 76
HERMISTON, OREGON
TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES
Figure 6c



UMATILLA DEPOT ACTIVITY

U. S. T. 77

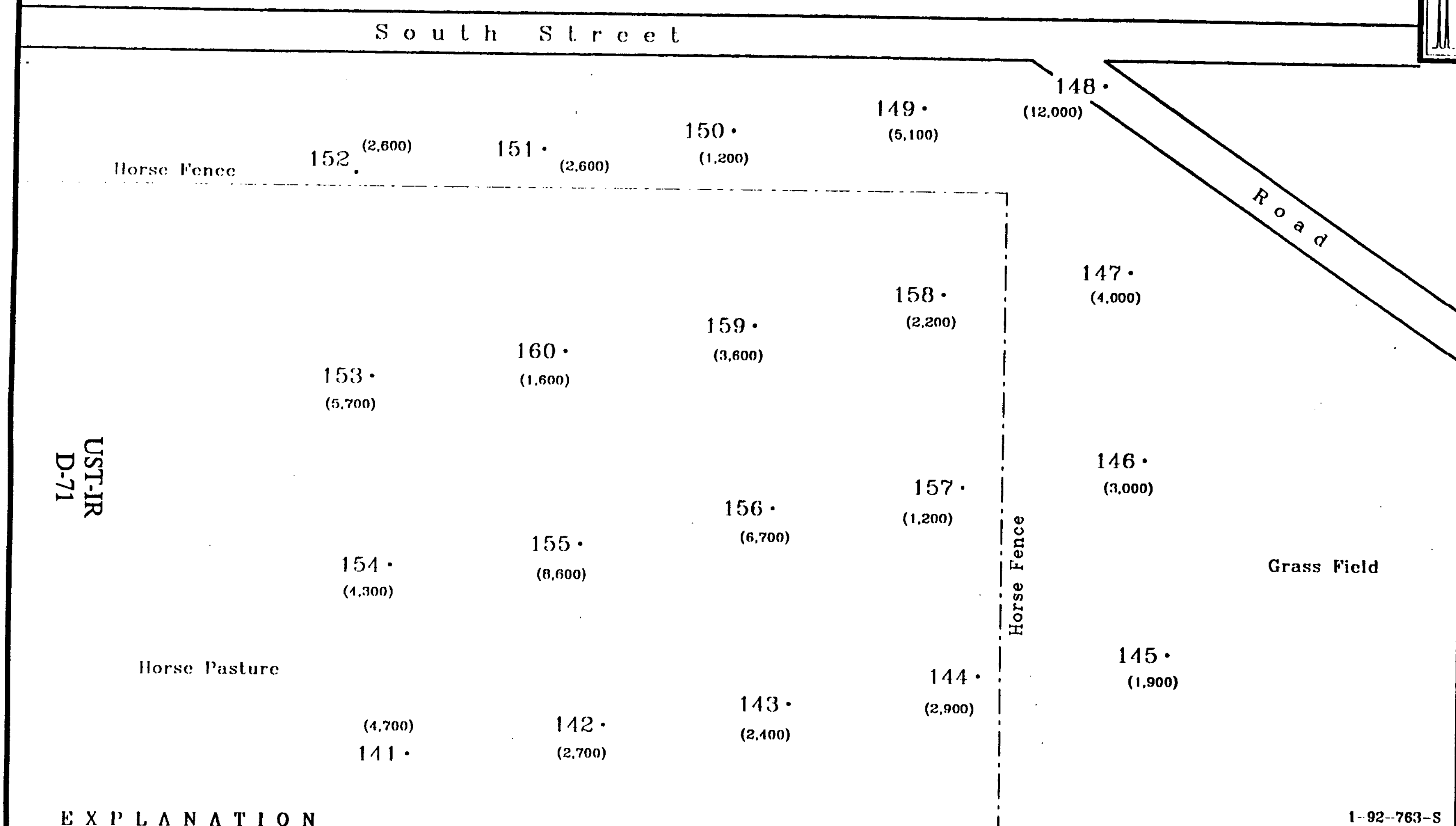
HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 7a

UST-IR
D-70

Tracer Research Corporation



UST-IR
D-71

EXPLANATION

•141 Sampling Probe Location

(310) CO2 Detection Limits (μg/L)

(870) M Methane Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

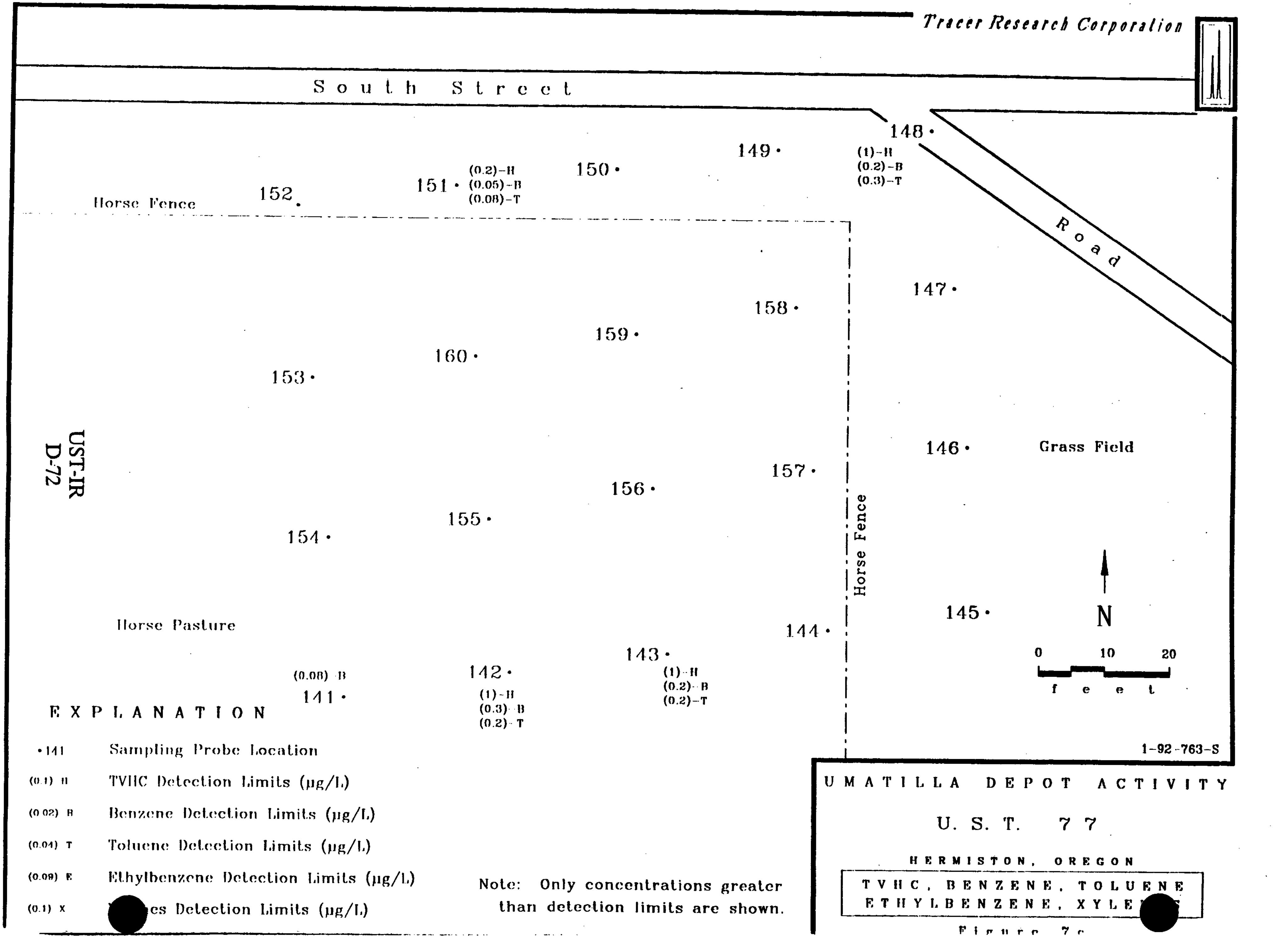
UMATILLA DEPOT ACTIVITY

U. S. T. 77

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

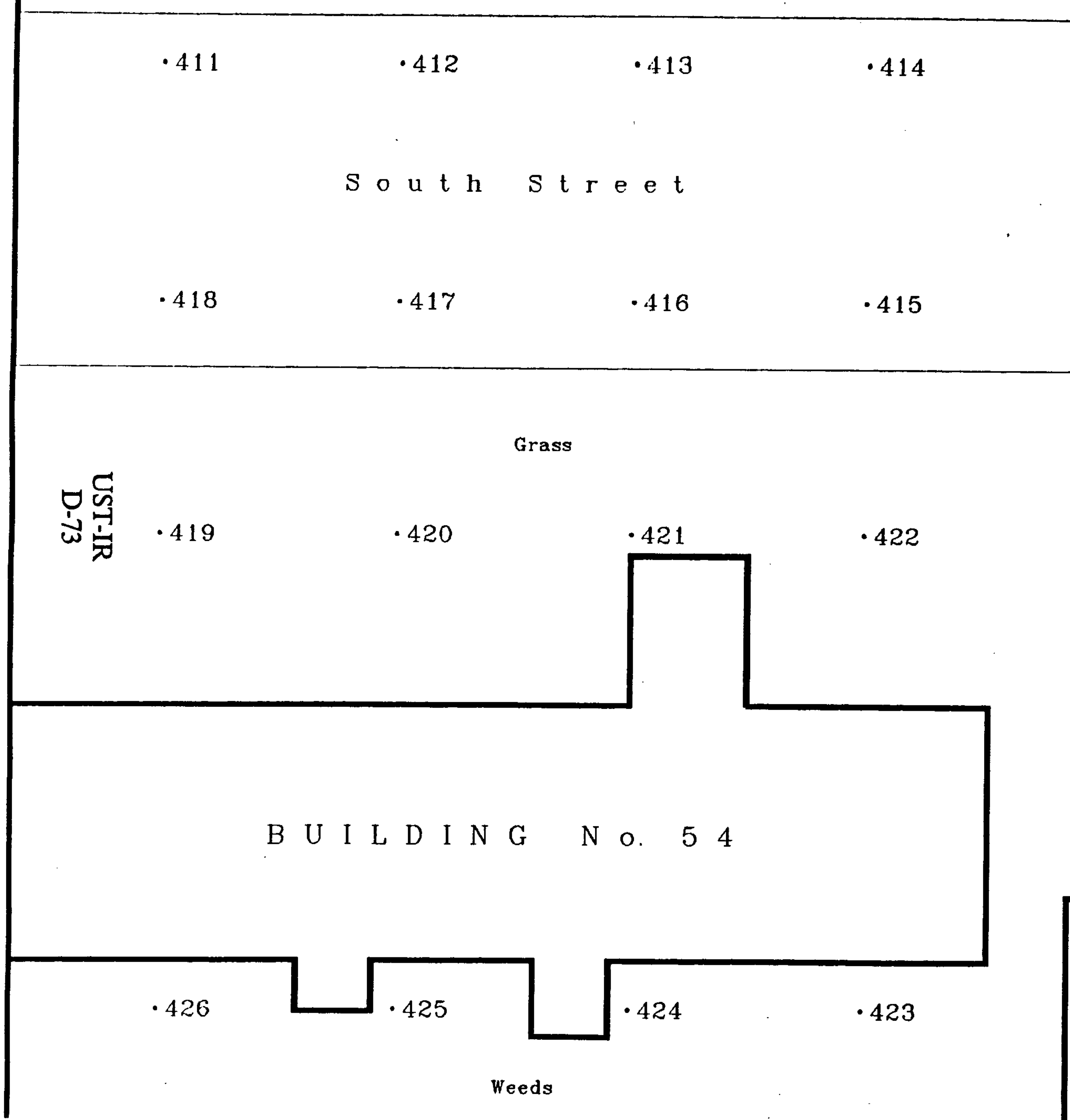
Figure 7b



Tracer Research Corporation
South Street
Road
Horse Fence
Horse Fence
Grass Field
Horse Pasture
148 •
(1)-H
(0.2)-B
(0.3)-T
149 •
150 •
151 •
(0.2)-H
(0.05)-B
(0.08)-T
152 •
147 •
158 •
159 •
160 •
153 •
146 •
157 •
156 •
155 •
154 •
145 •
144 •
143 •
(1)-H
(0.2)-B
(0.2)-T
142 •
(1)-H
(0.3)-B
(0.2)-T
(0.08)-B
141 •
N
0
10
20
f e e t
1-92-763-S
EXPLANATION
•141 Sampling Probe Location
(0.1) H TVHC Detection Limits (µg/L)
(0.02) B Benzene Detection Limits (µg/L)
(0.04) T Toluene Detection Limits (µg/L)
(0.09) E Ethylbenzene Detection Limits (µg/L)
(0.1) X es Detection Limits (µg/L)
Note: Only concentrations greater than detection limits are shown.
UMATILLA DEPOT ACTIVITY
U. S. T. 77
HERMISTON, OREGON
TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLE

UST-IR
D-72

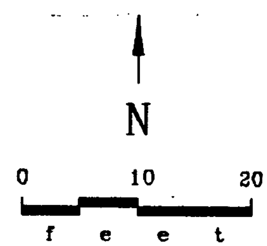
Tracer Research Corporation



UST-IR
D-73

EXPLANATION

•411 Sampling Probe Location



1-92-763-S

UMATILLA DEPOT ACTIVITY

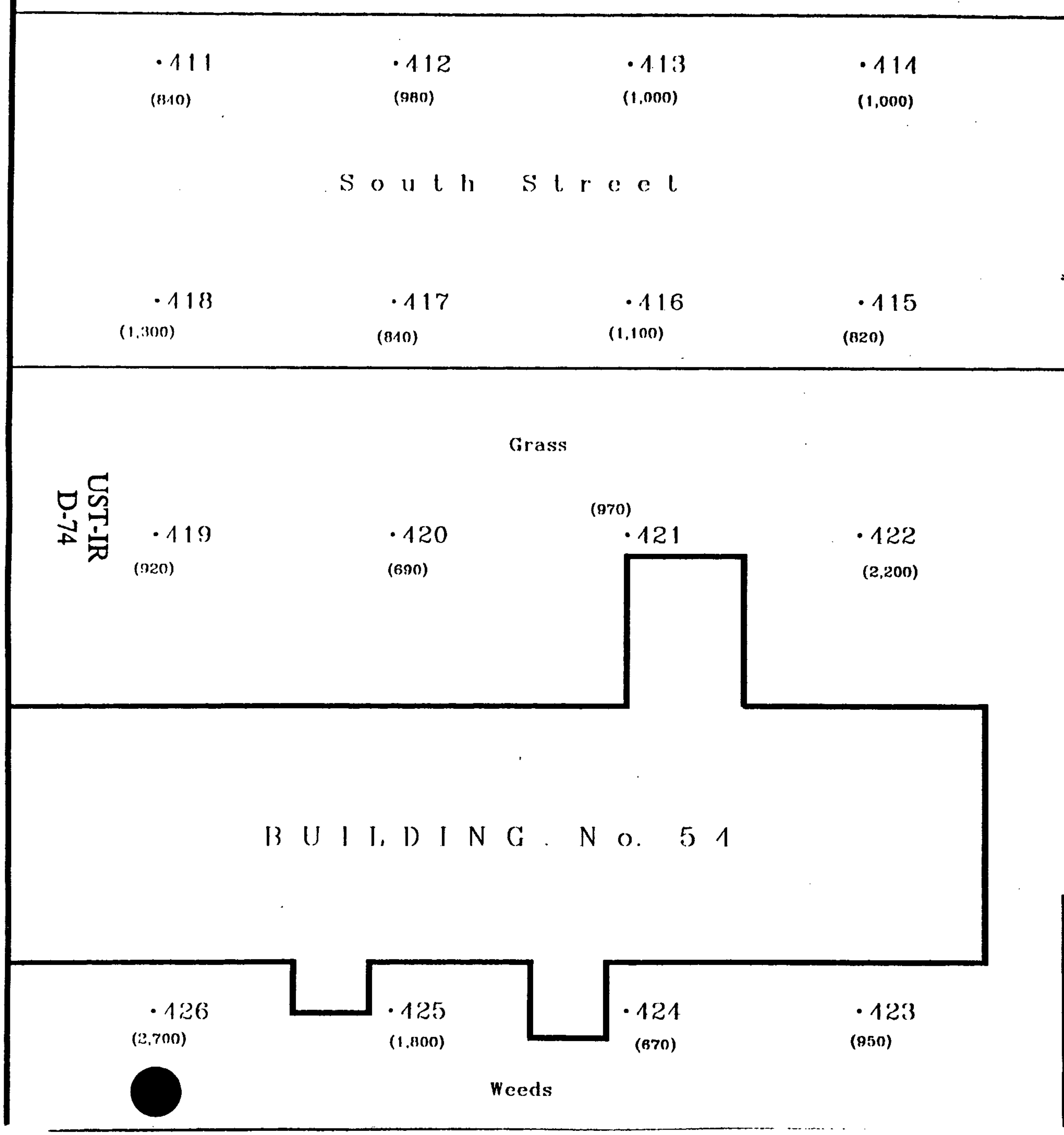
U. S. T. 79

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 8a

Tracer Research Corporation



EXPLANATION

•411 Sampling Probe Location

(310) CO2 Detection Limits (μg/L)

(840)--M Methane Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 10 20
feet

1-92-763-S

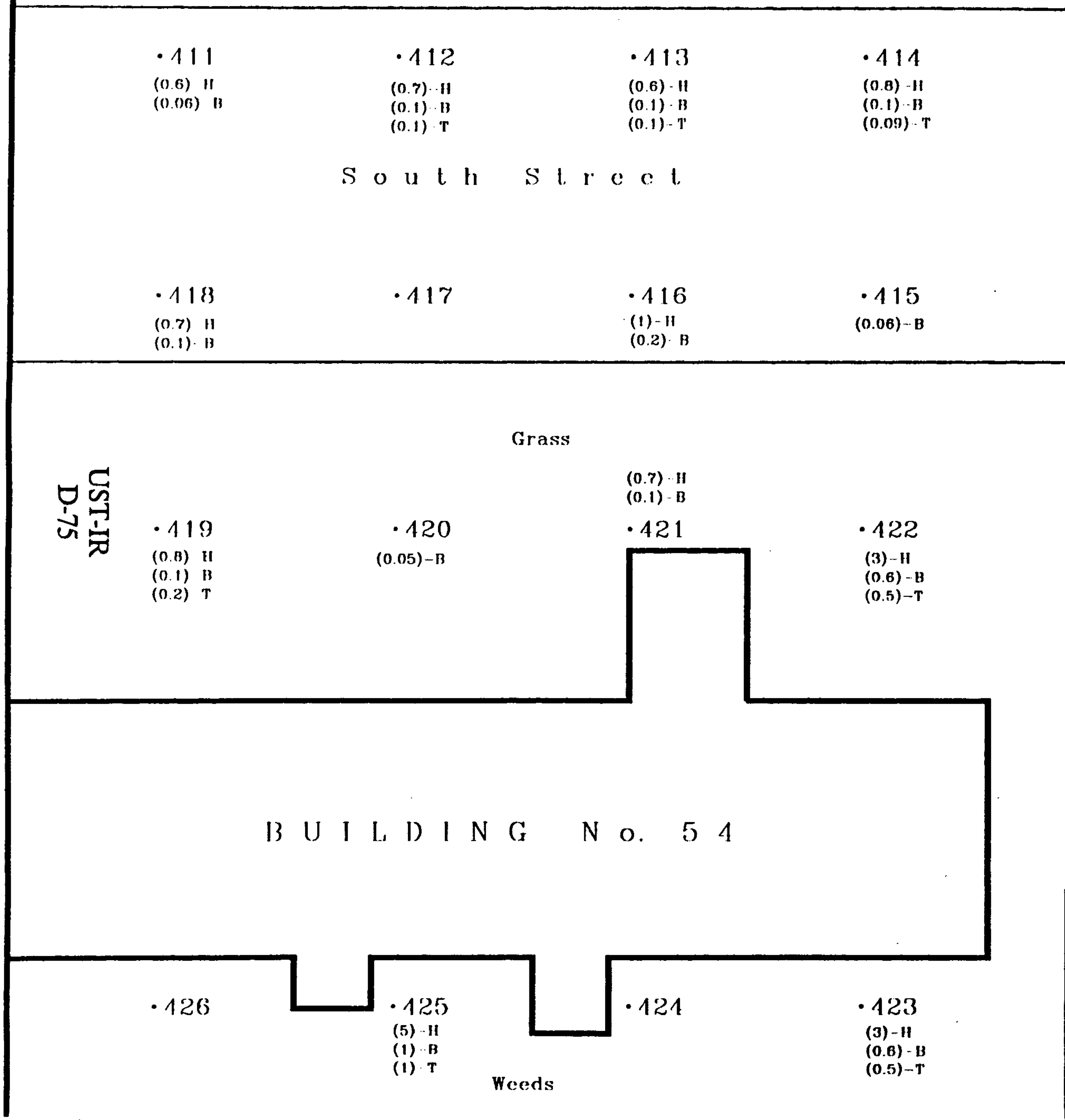
UMATILLA DEPOT ACTIVITY

U. S. T. 79

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 8b



UST-IR
D-75

Tracer Research Corporation

EXPLANATION

•411	Sampling Probe Location
(0.4)-H	TVHC Detection Limits (µg/L)
(0.04)-B	Benzene Detection Limits (µg/L)
(0.09)-T	Toluene Detection Limits (µg/L)
(0.2)-E	Ethylbenzene Detection Limits (µg/L)
(0.4)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

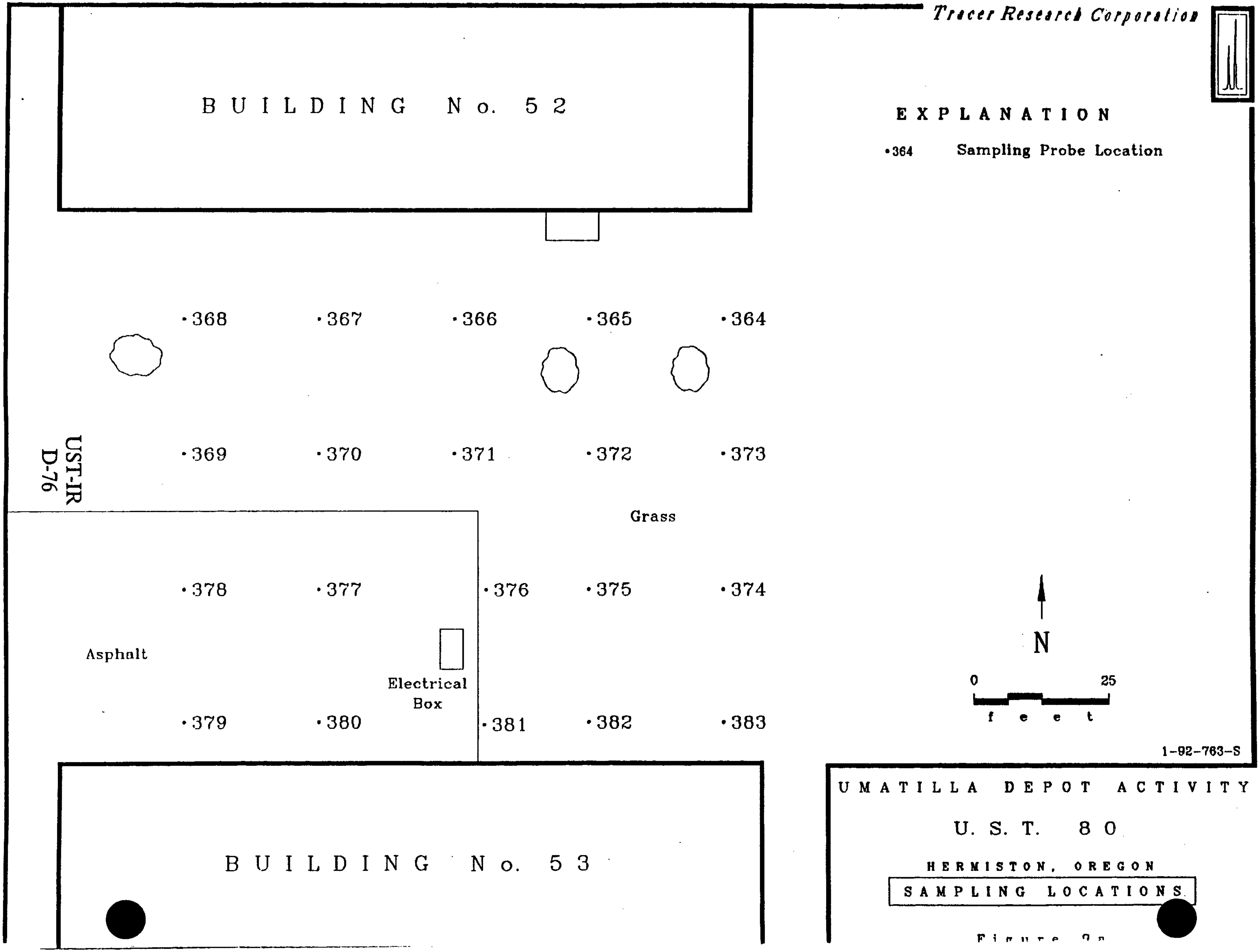
UMATILLA DEPOT ACTIVITY

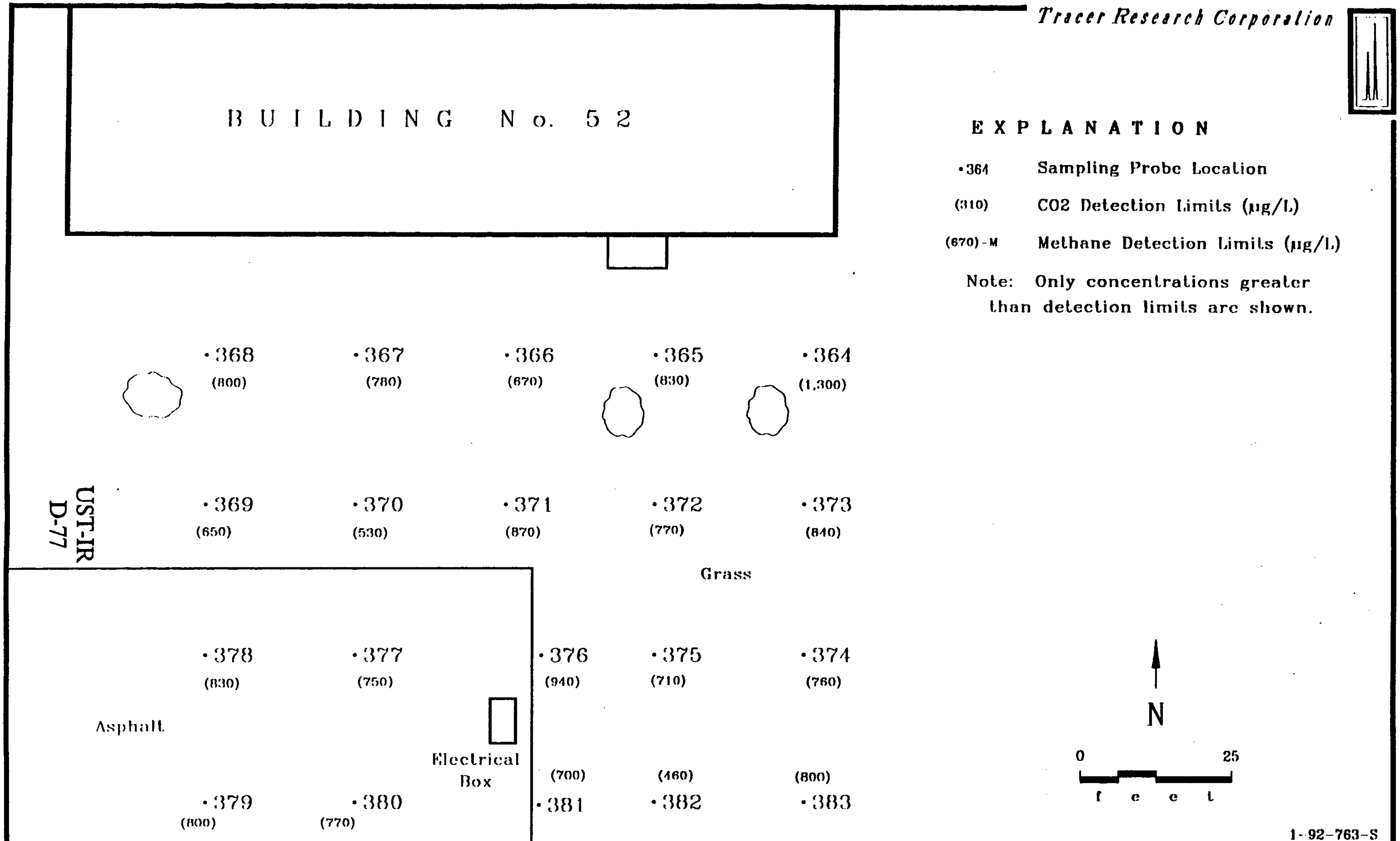
U. S. T. 79

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 8c


Tracer Research Corporation
EXPLANATION
•364 Sampling Probe Location
BUILDING No. 52
BUILDING No. 53
•368 •367 •366 •365 •364
•369 •370 •371 •372 •373
Grass
•378 •377 •376 •375 •374
•379 •380 •381 •382 •383
Asphalt
Electrical Box
N
0 25
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 80
HERMISTON, OREGON
SAMPLING LOCATIONS
UST-IR
D-76



UMATILLA DEPOT ACTIVITY

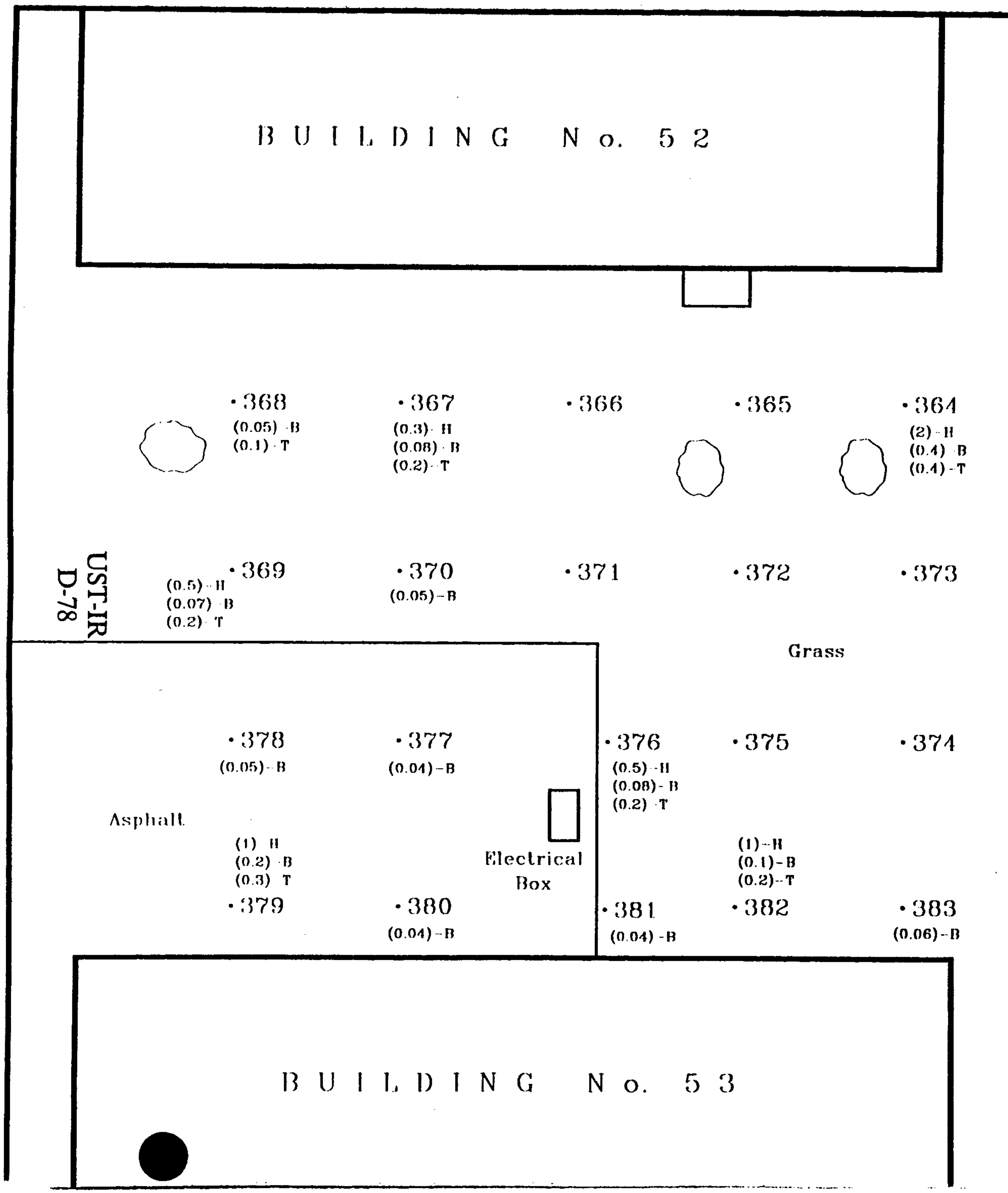
U. S. T. 80

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 9b

Tracer Research Corporation



EXPLANATION

•364	Sampling Probe Location
(0.3)- H	TVHC Detection Limits (µg/L)
(0.04) -B	Benzene Detection Limits (µg/L)
(0.1)- T	Toluene Detection Limits (µg/L)
(0.2)- E	Ethylbenzene Detection Limits (µg/L)
(0.3)- X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 25
feet

1-92-763-S

UMATILLA DEPOT ACTIVITY

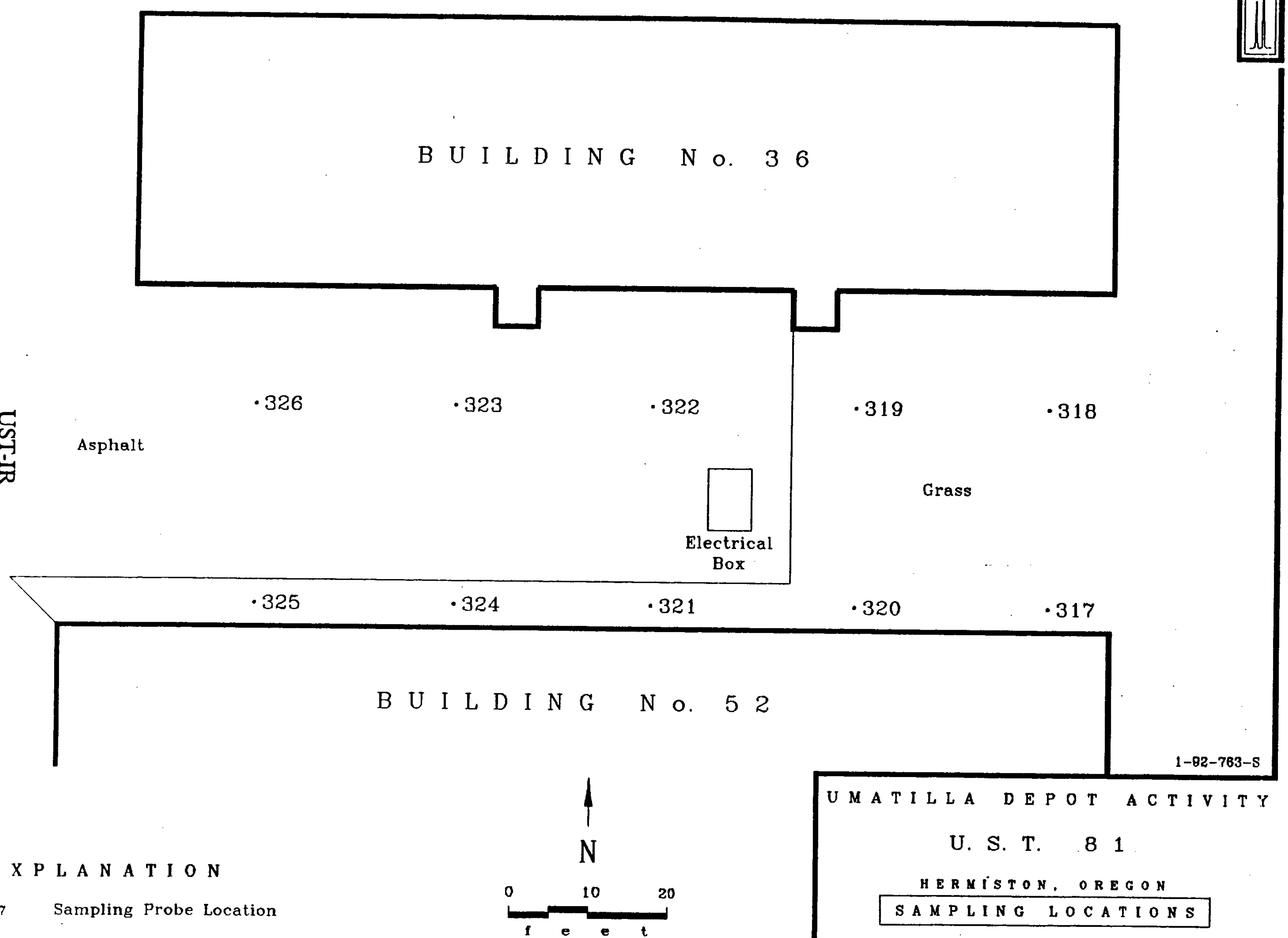
U. S. T. 80

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 9c

Tracer Research Corporation



UST-IR
D-79

1-92-763-S

UMATILLA DEPOT ACTIVITY

U. S. T. 81

HERMISTON, OREGON

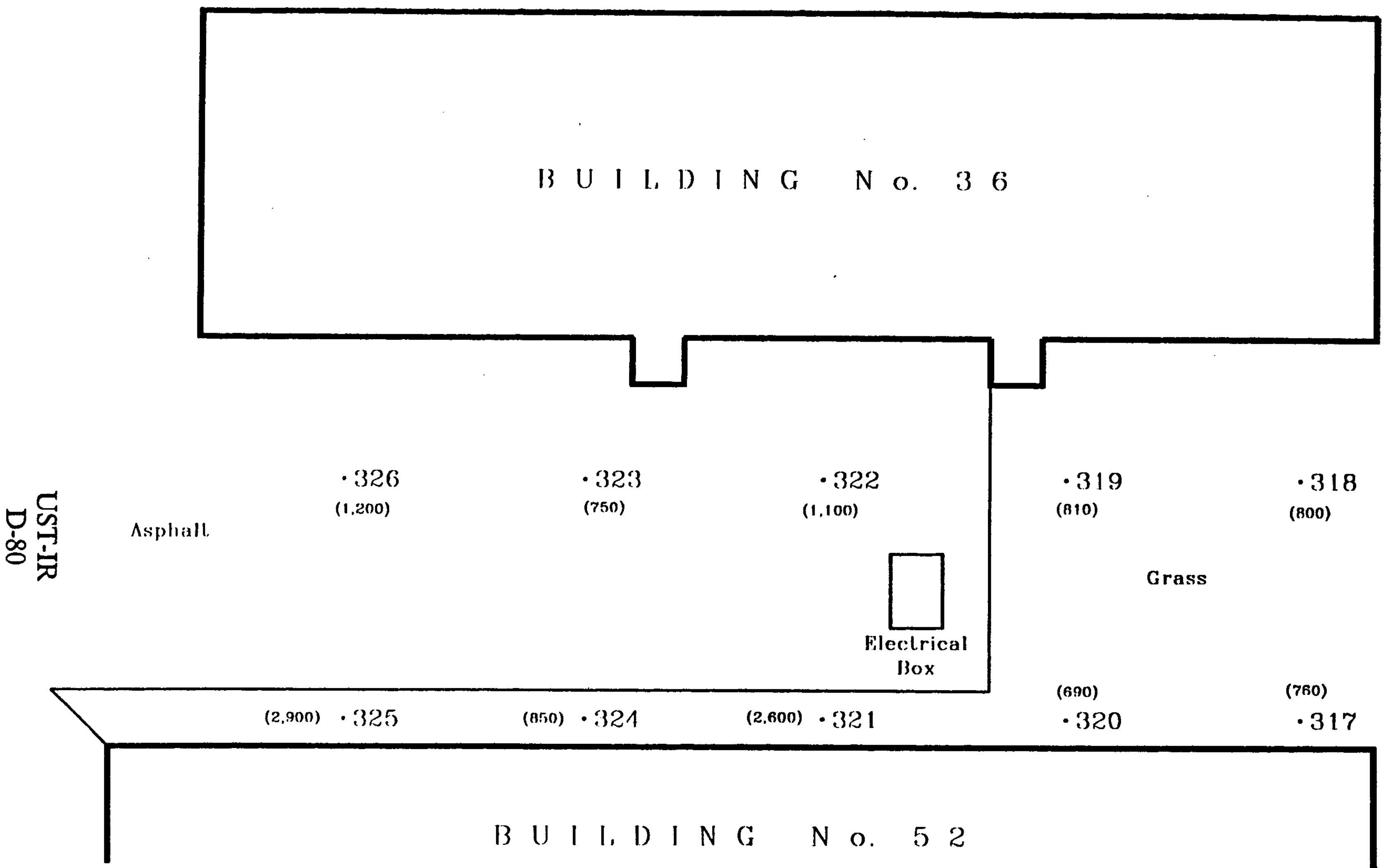
SAMPLING LOCATIONS

Figure 10a

EXPLANATION

•317 Sampling Probe Location

Tracer Research Corporation



UST-IR
D-80

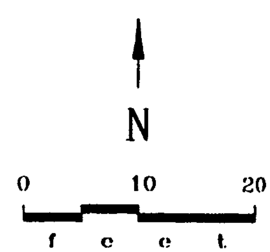
EXPLANATION

•317 Sampling Probe Location

(310) CO2 Detection Limits (µg/L)

(730) M Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.



1-92-763-S

UMATILLA DEPOT ACTIVITY

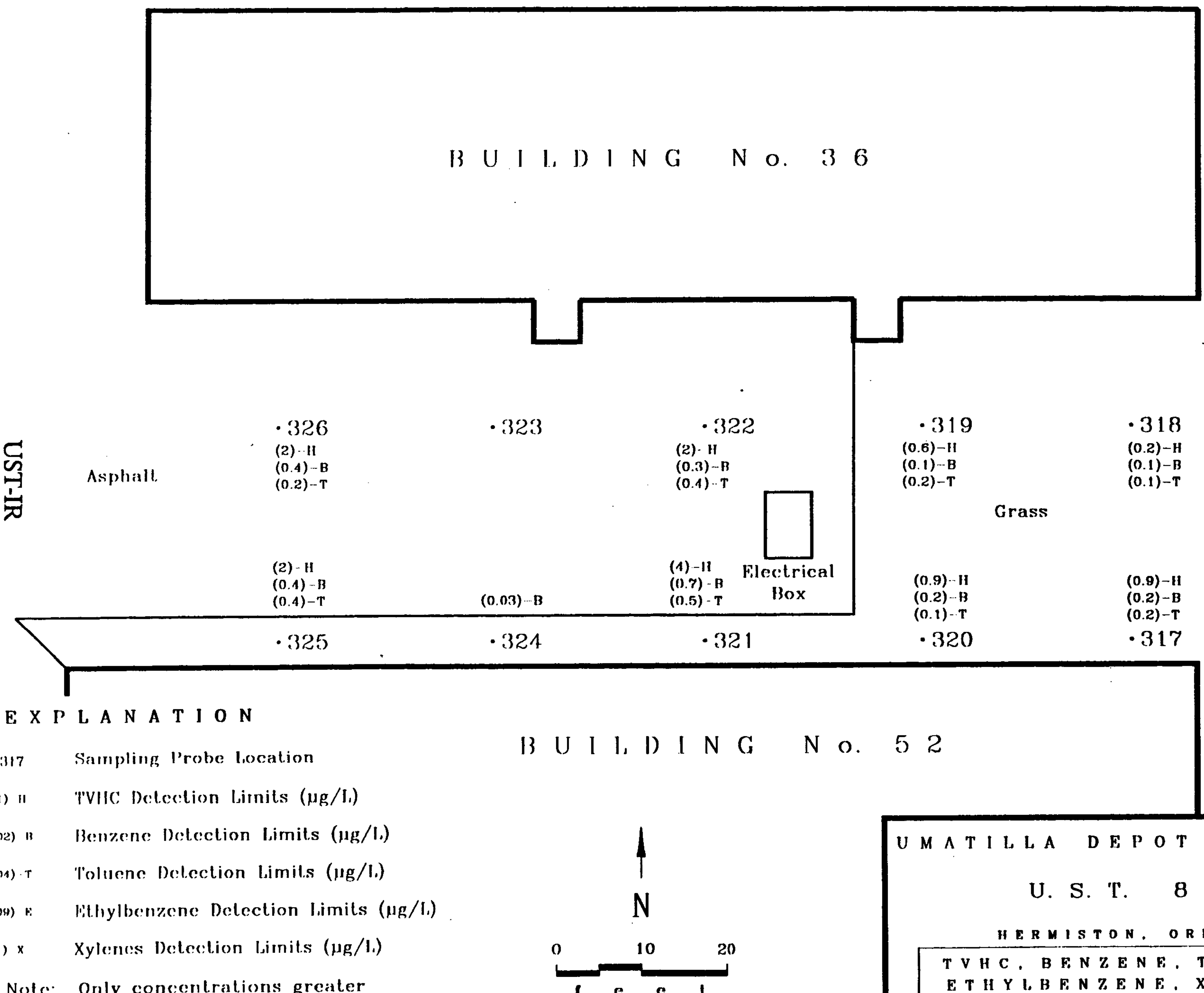
U. S. T. 81

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 10b

Tracer Research Corporation



UST-IR
D-81

EXPLANATION

•317 Sampling Probe Location

(0.1) H TVHC Detection Limits (µg/L)

(0.02) B Benzene Detection Limits (µg/L)

(0.04) T Toluene Detection Limits (µg/L)

(0.09) E Ethylbenzene Detection Limits (µg/L)

(0.1) X Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

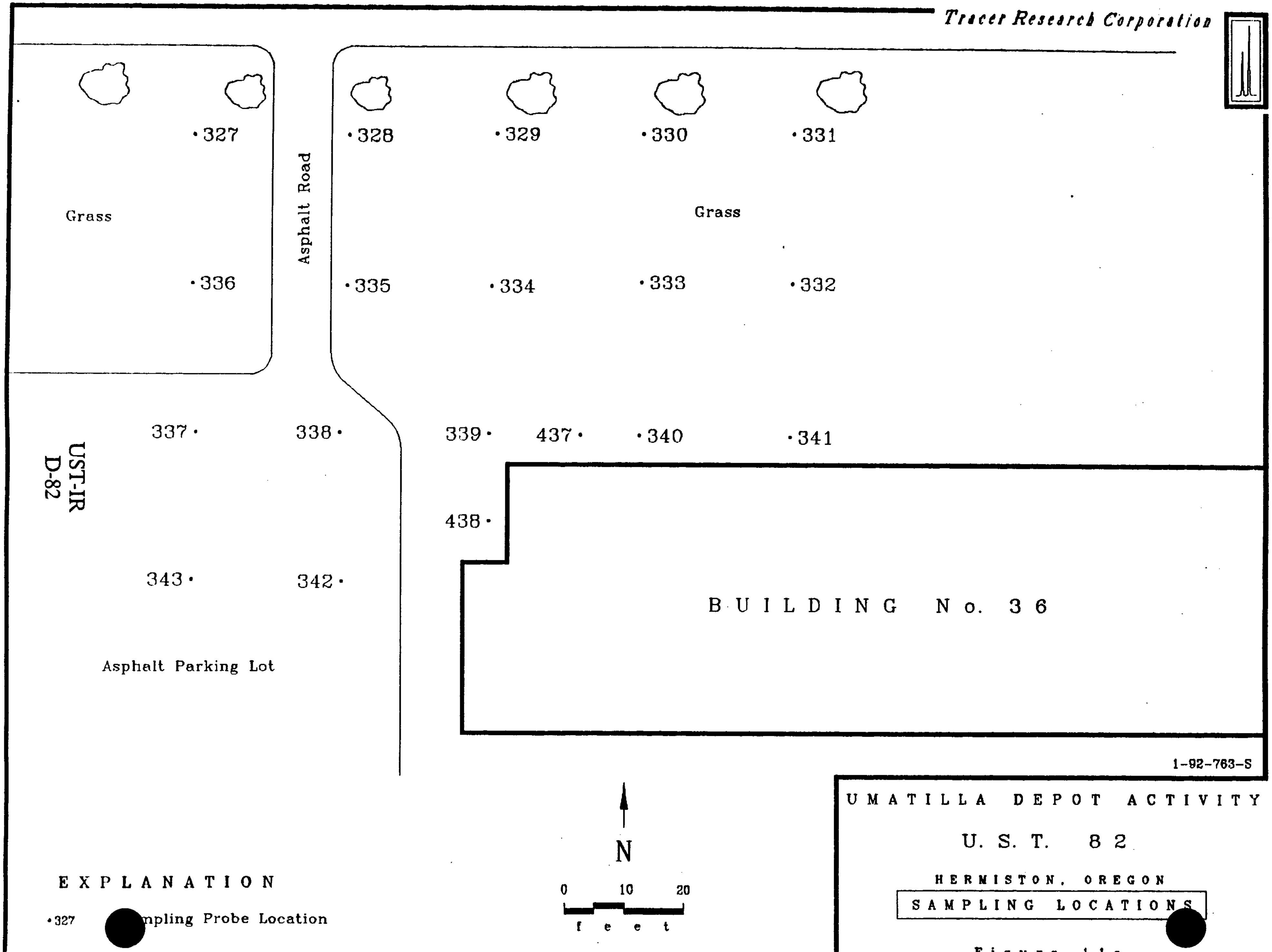
UMATILLA DEPOT ACTIVITY

U. S. T. 81

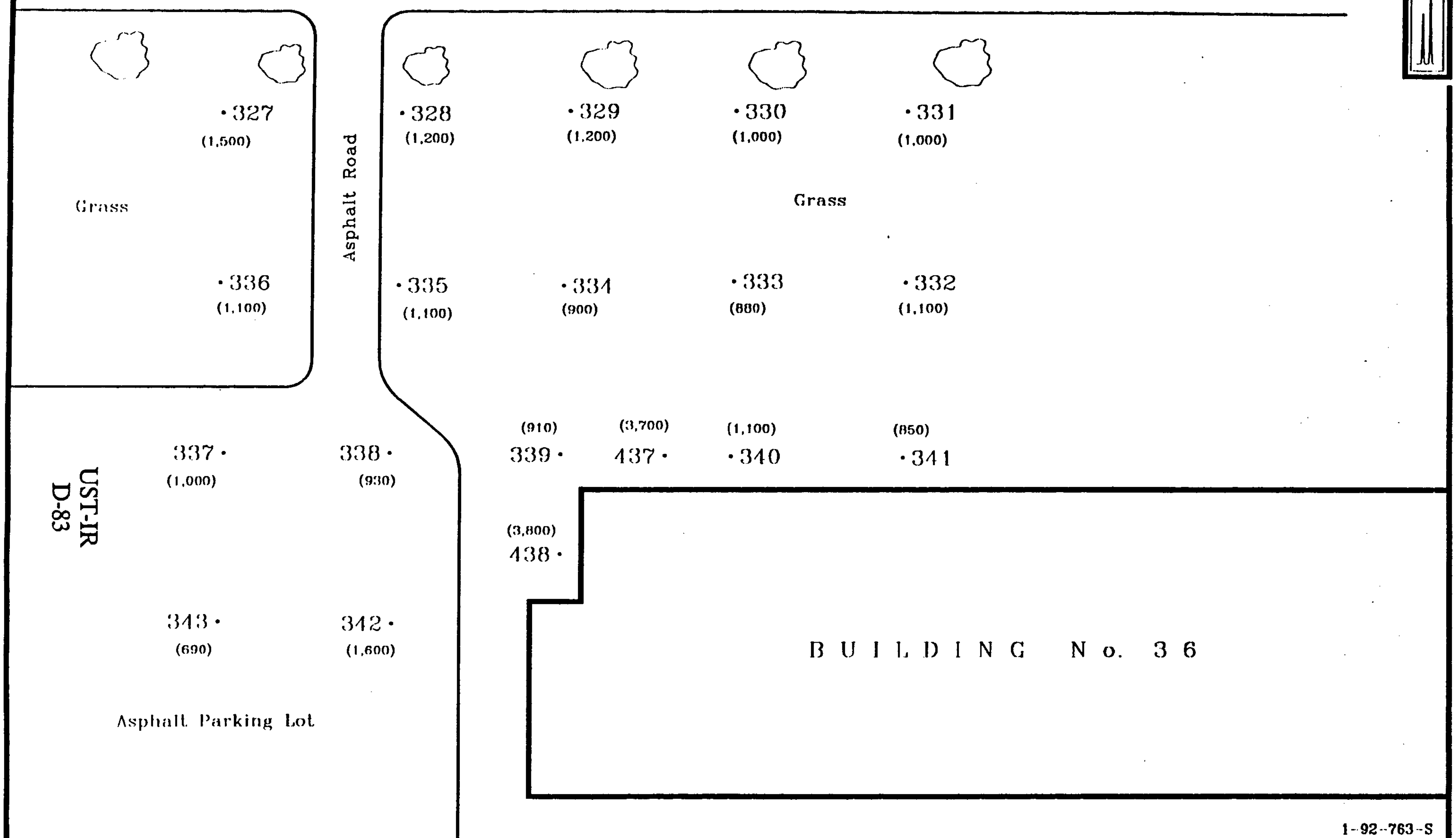
HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 10c


Tracer Research Corporation
Grass
Asphalt Road
327
328
329
330
331
336
335
334
333
332
337
338
339
437
340
341
438
343
342
Asphalt Parking Lot
BUILDING No. 36
UST-IR
D-82
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 82
HERMISTON, OREGON
SAMPLING LOCATIONS
N
0
10
20
feet
EXPLANATION
•327
mpling Probe Location

Tracer Research Corporation



UST-IR
D-83

EXPLANATION

•327 Sampling Probe Location

(310) CO2 Detection Limits (µg/L)

(700) M Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

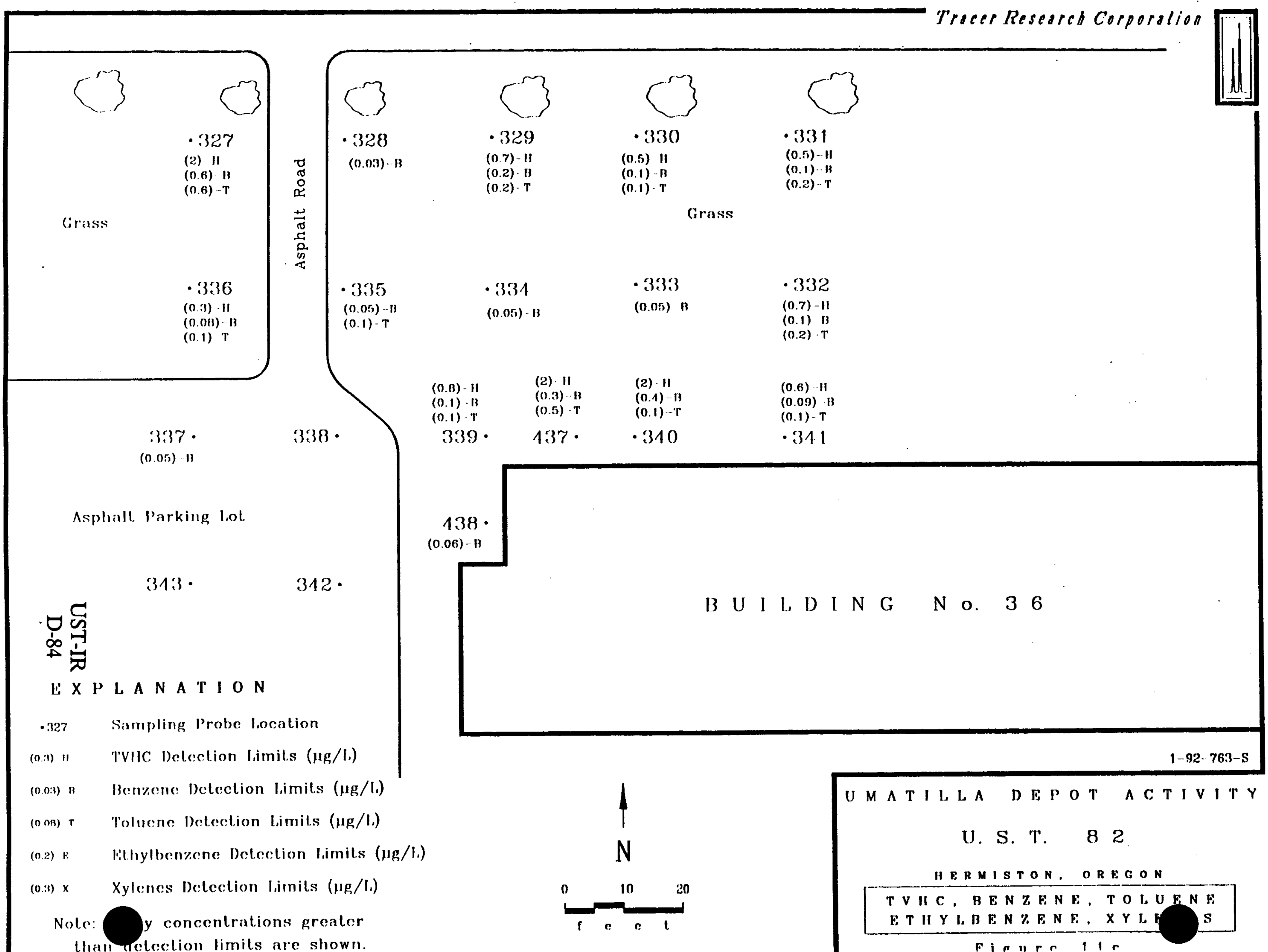
UMATILLA DEPOT ACTIVITY

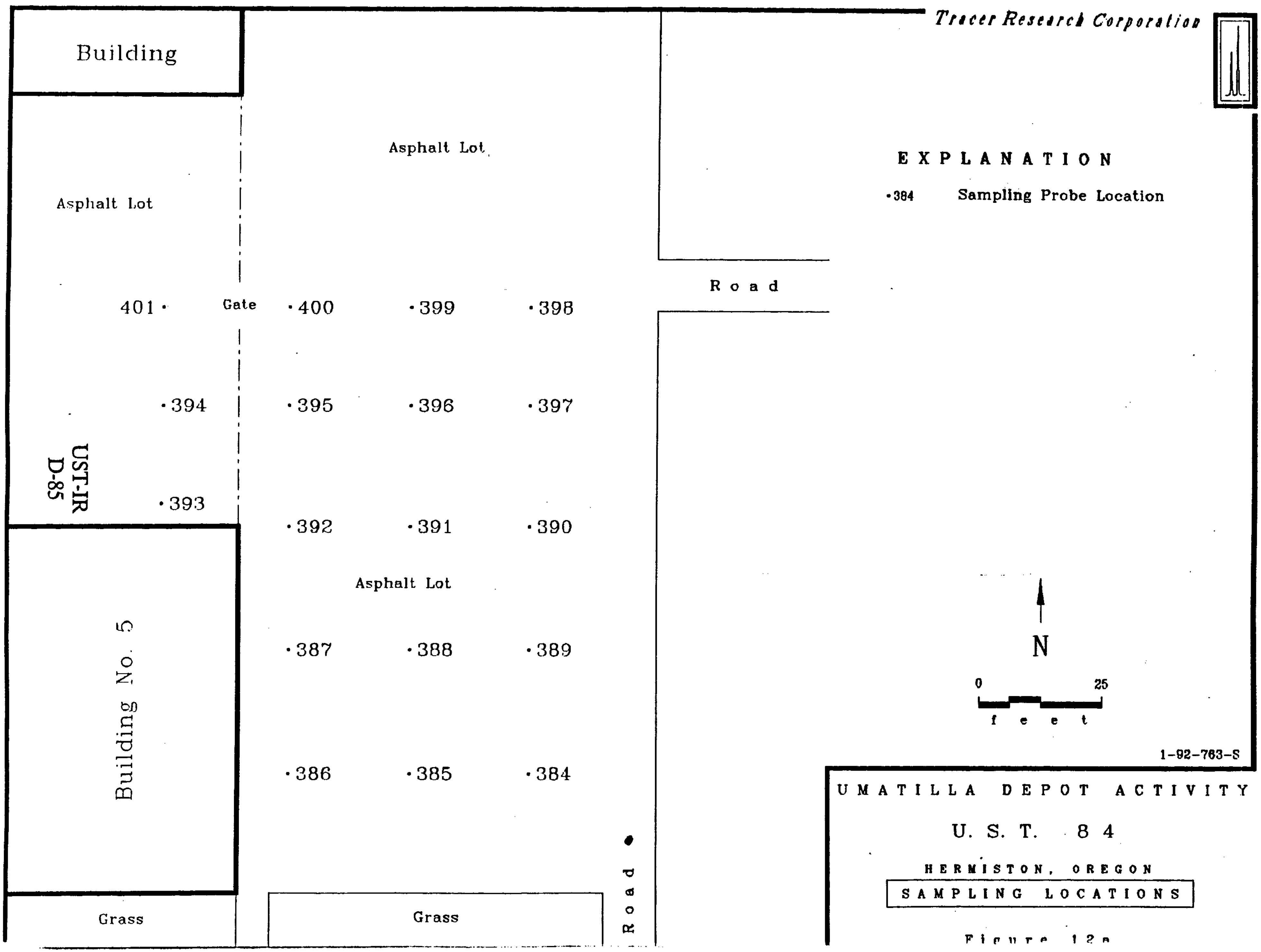
U. S. T. 82

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 11b


Tracer Research Corporation
Grass
Asphalt Road
•327
(2)-H
(0.6)-B
(0.6)-T
•336
(0.3)-H
(0.08)-B
(0.1)-T
•328
(0.03)-B
•329
(0.7)-H
(0.2)-B
(0.2)-T
•330
(0.5)-H
(0.1)-B
(0.1)-T
•331
(0.5)-H
(0.1)-B
(0.2)-T
Grass
•335
(0.05)-B
(0.1)-T
•334
(0.05)-B
•333
(0.05)-B
•332
(0.7)-H
(0.1)-B
(0.2)-T
339•
(0.8)-H
(0.1)-B
(0.1)-T
437•
(2)-H
(0.3)-B
(0.5)-T
•340
(2)-H
(0.4)-B
(0.1)-T
•341
(0.6)-H
(0.09)-B
(0.1)-T
337•
(0.05)-B
338•
Asphalt Parking Lot
438•
(0.06)-B
343•
342•
BUILDING No. 36
UST-IR
D-84
EXPLANATION
•327 Sampling Probe Location
(0.3) H TVHC Detection Limits (µg/L)
(0.03) B Benzene Detection Limits (µg/L)
(0.08) T Toluene Detection Limits (µg/L)
(0.2) E Ethylbenzene Detection Limits (µg/L)
(0.3) X Xylenes Detection Limits (µg/L)
Note: y concentrations greater
than detection limits are shown.
N
0 10 20
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 82
HERMISTON, OREGON
TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYL S
Figure 11c



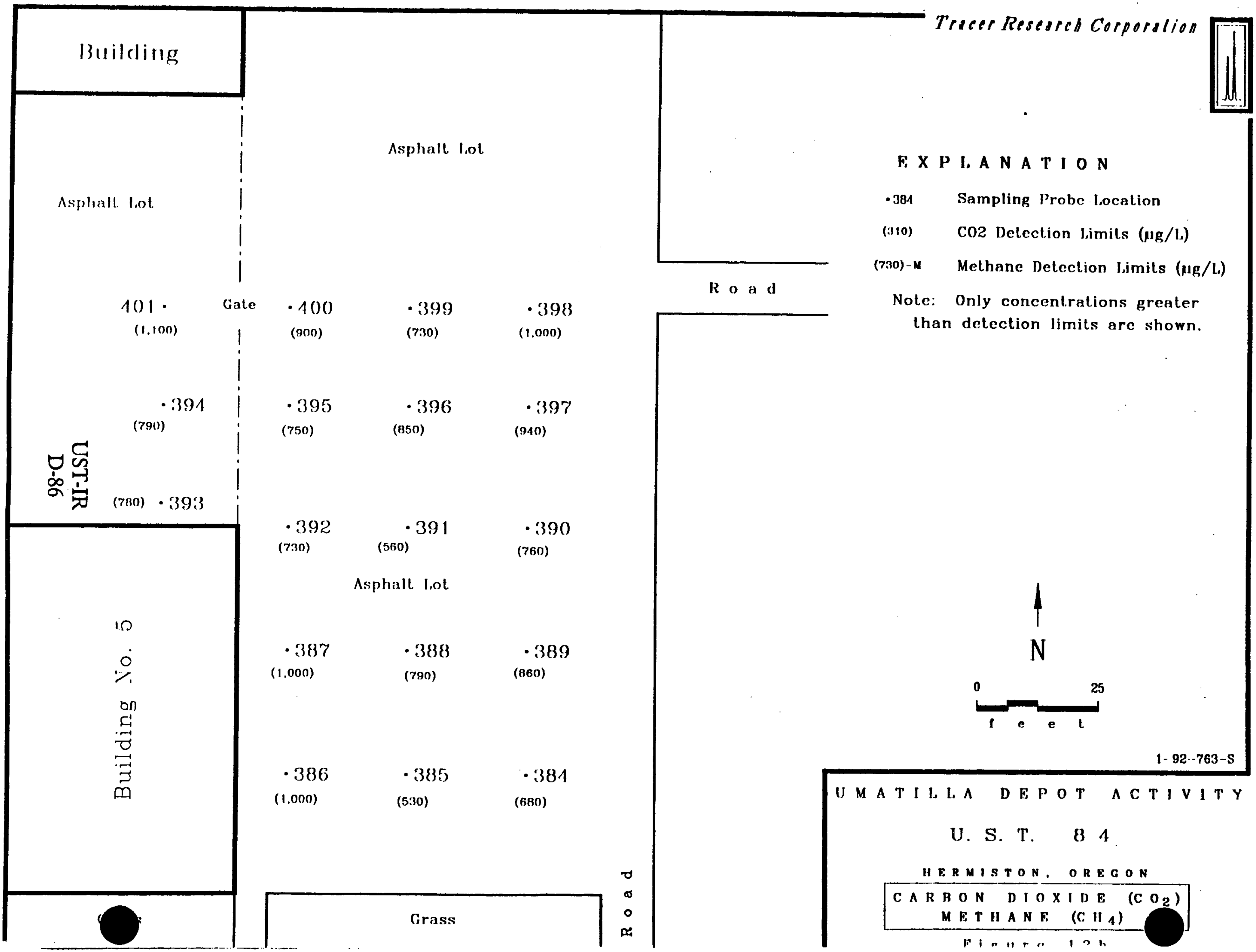
UMATILLA DEPOT ACTIVITY

U. S. T. 84

HERMISTON, OREGON

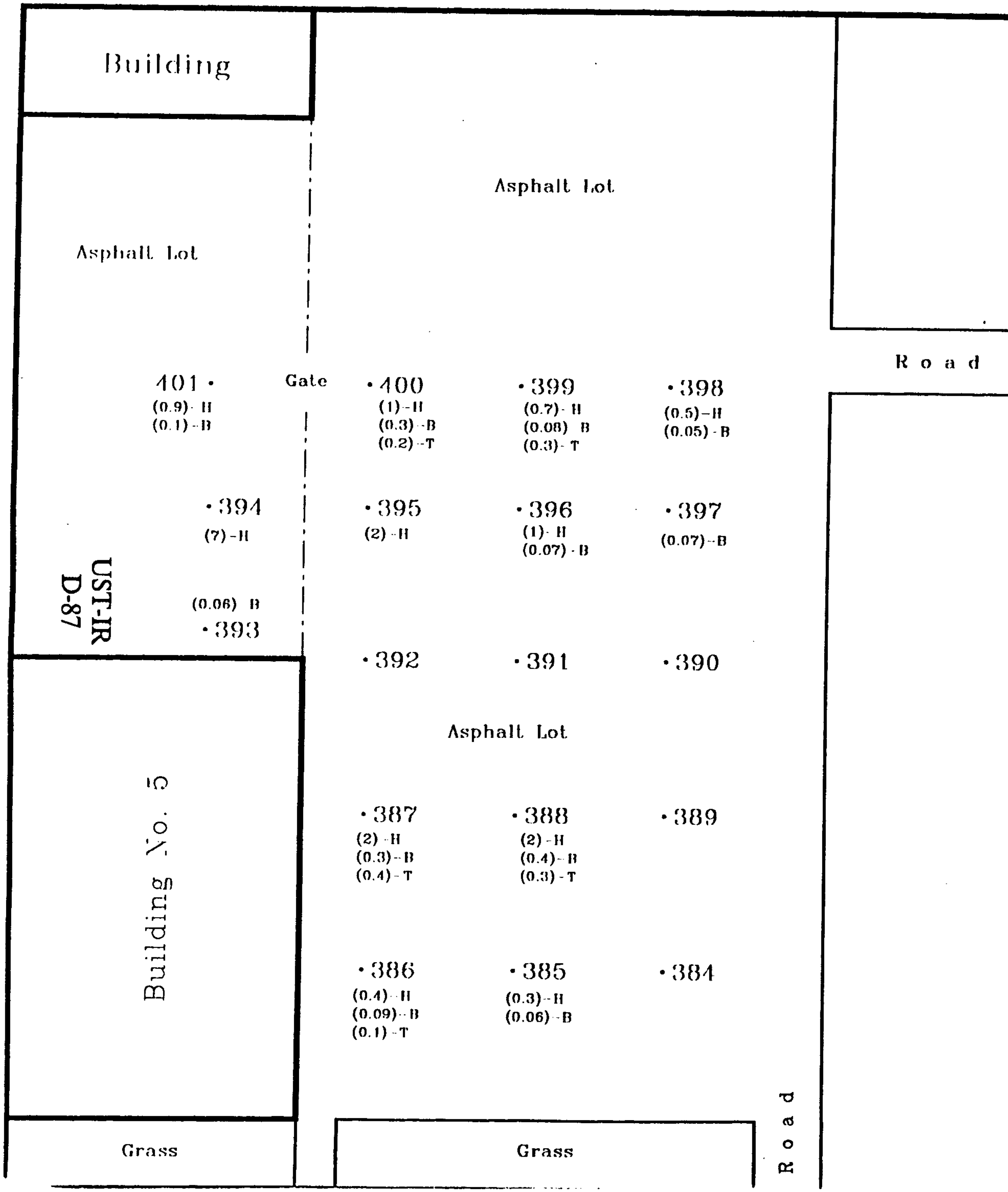
SAMPLING LOCATIONS

Figure 12a



Tracer Research Corporation
Building
Asphalt Lot
Asphalt Lot
Gate
Road
401 • (1,100)
•400 (900)
•399 (730)
•398 (1,000)
•394 (790)
•395 (750)
•396 (850)
•397 (940)
UST-IR
D-86
(780) •393
•392 (730)
•391 (560)
•390 (760)
Asphalt Lot
•387 (1,000)
•388 (790)
•389 (860)
•386 (1,000)
•385 (530)
•384 (680)
Building No. 5
Grass
Road
EXPLANATION
•384 Sampling Probe Location
(310) CO2 Detection Limits (µg/L)
(730)-M Methane Detection Limits (µg/L)
Note: Only concentrations greater than detection limits are shown.
N
0 25
feet
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 84
HERMISTON, OREGON
CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Tracer Research Corporation



EXPLANATION

•384	Sampling Probe Location
(0.3) - H	TVHC Detection Limits (µg/L)
(0.04) - B	Benzene Detection Limits (µg/L)
(0.08) - T	Toluene Detection Limits (µg/L)
(0.2) E	Ethylbenzene Detection Limits (µg/L)
(0.3) - X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 25
feet

1-92-763-S

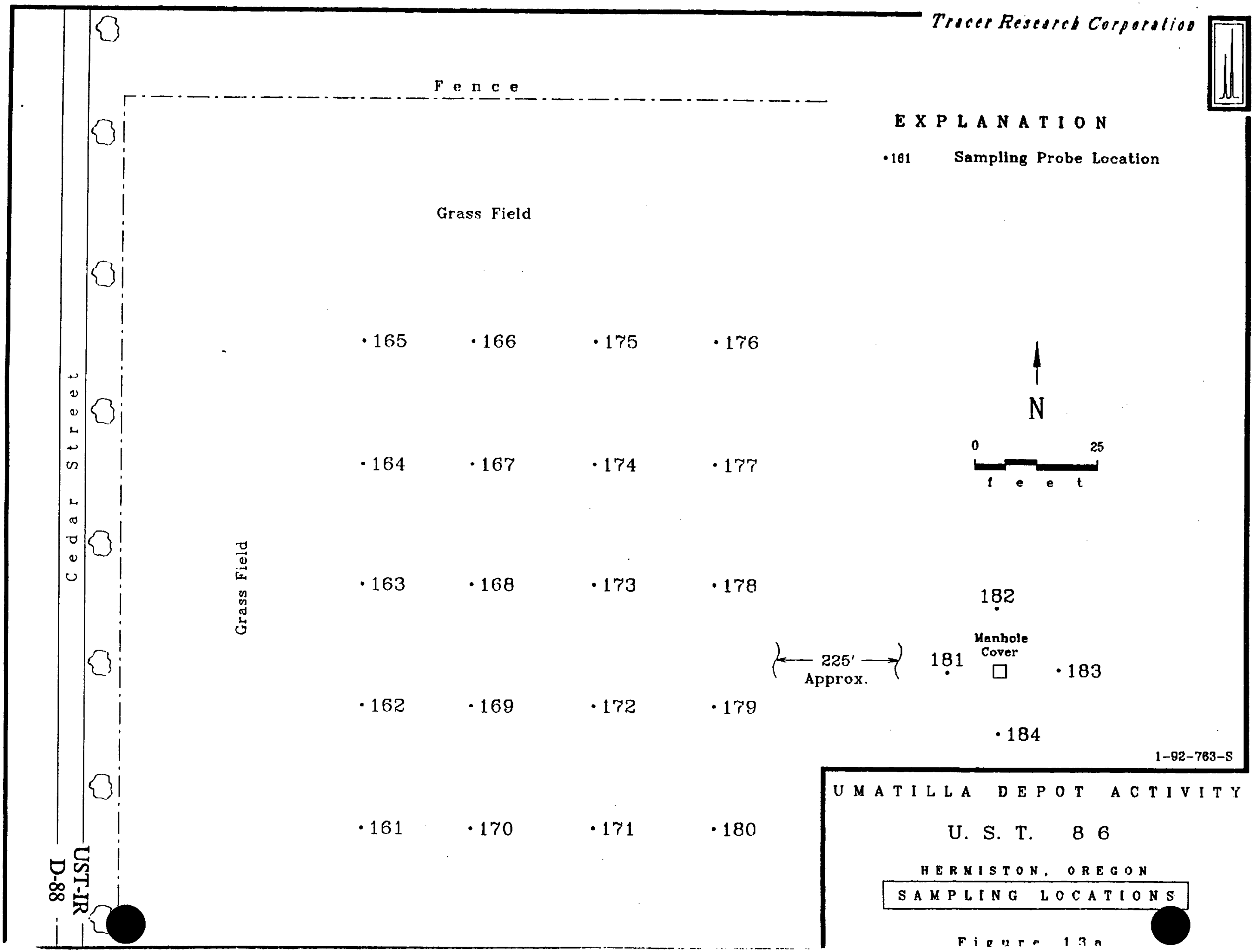
UMATILLA DEPOT ACTIVITY

U. S. T. 84

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 12c



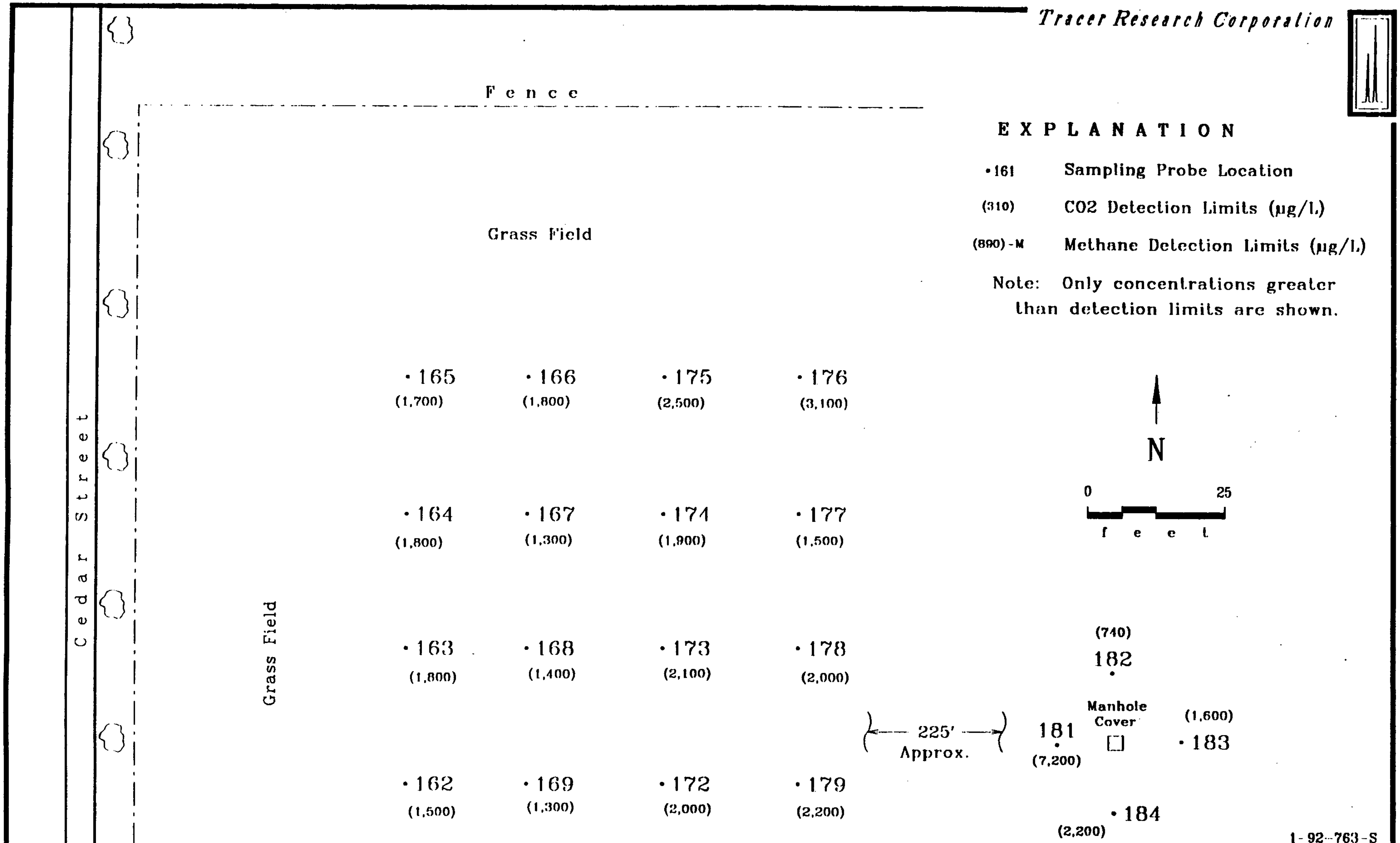
UMATILLA DEPOT ACTIVITY

U. S. T. 86

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 13a



UMATILLA DEPOT ACTIVITY

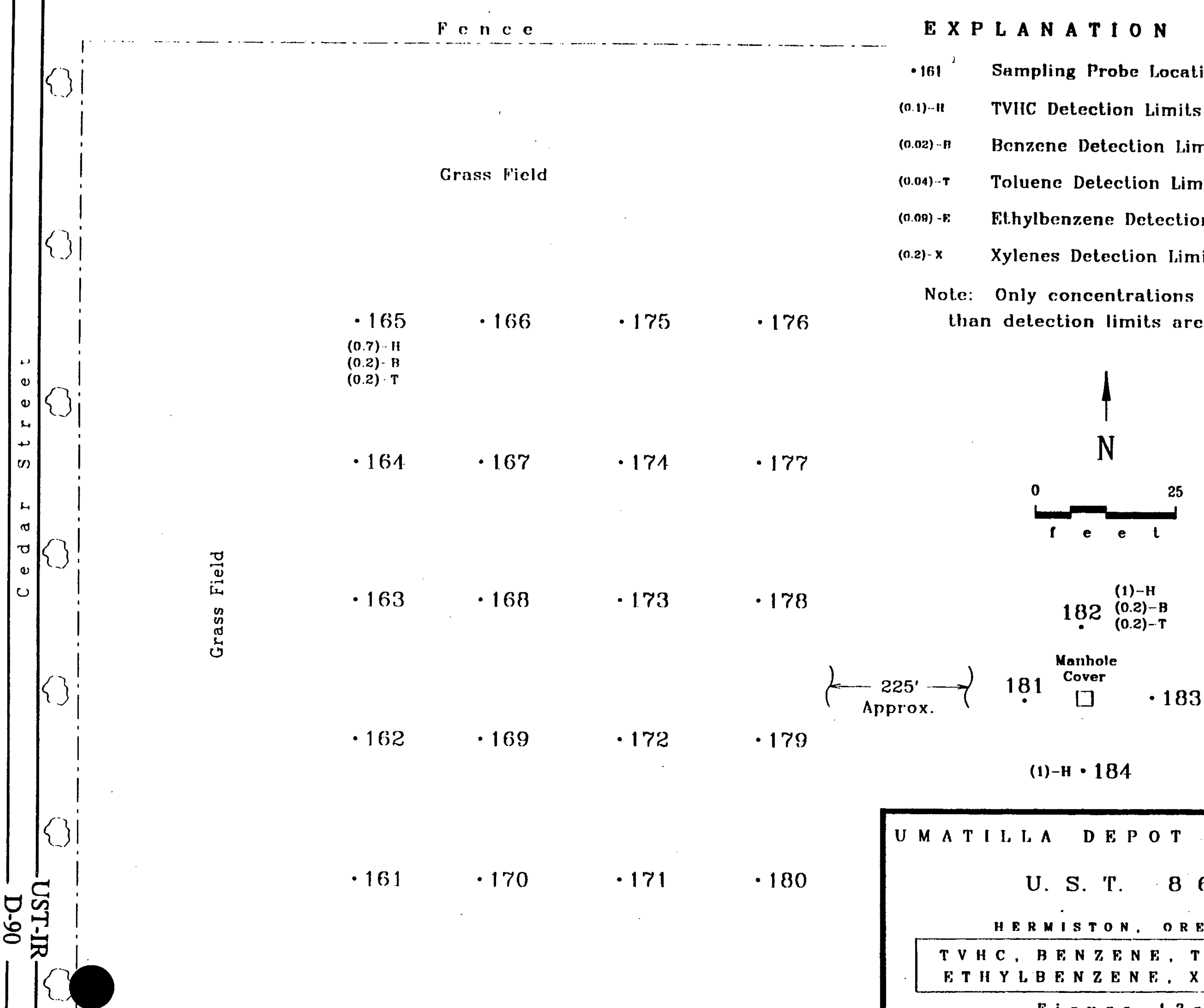
U. S. T. 86

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 13b

Tracer Research Corporation



EXPLANATION

·161	Sampling Probe Location
(0.1)-H	TVHC Detection Limits (µg/L)
(0.02)-B	Benzene Detection Limits (µg/L)
(0.04)-T	Toluene Detection Limits (µg/L)
(0.09)-E	Ethylbenzene Detection Limits (µg/L)
(0.2)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

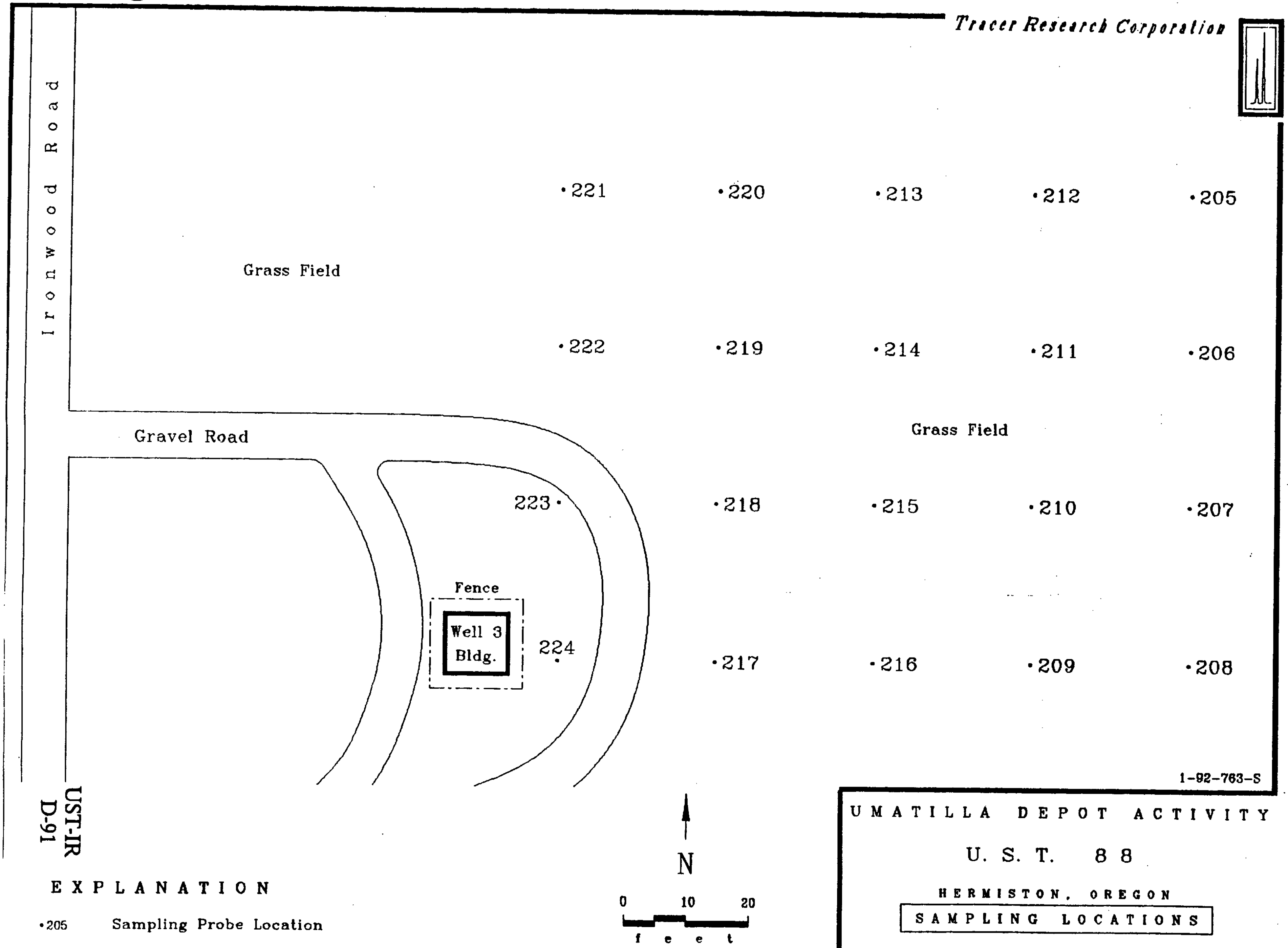
UMATILLA DEPOT ACTIVITY

U. S. T. 86

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 13c



UMATILLA DEPOT ACTIVITY

U. S. T. 88

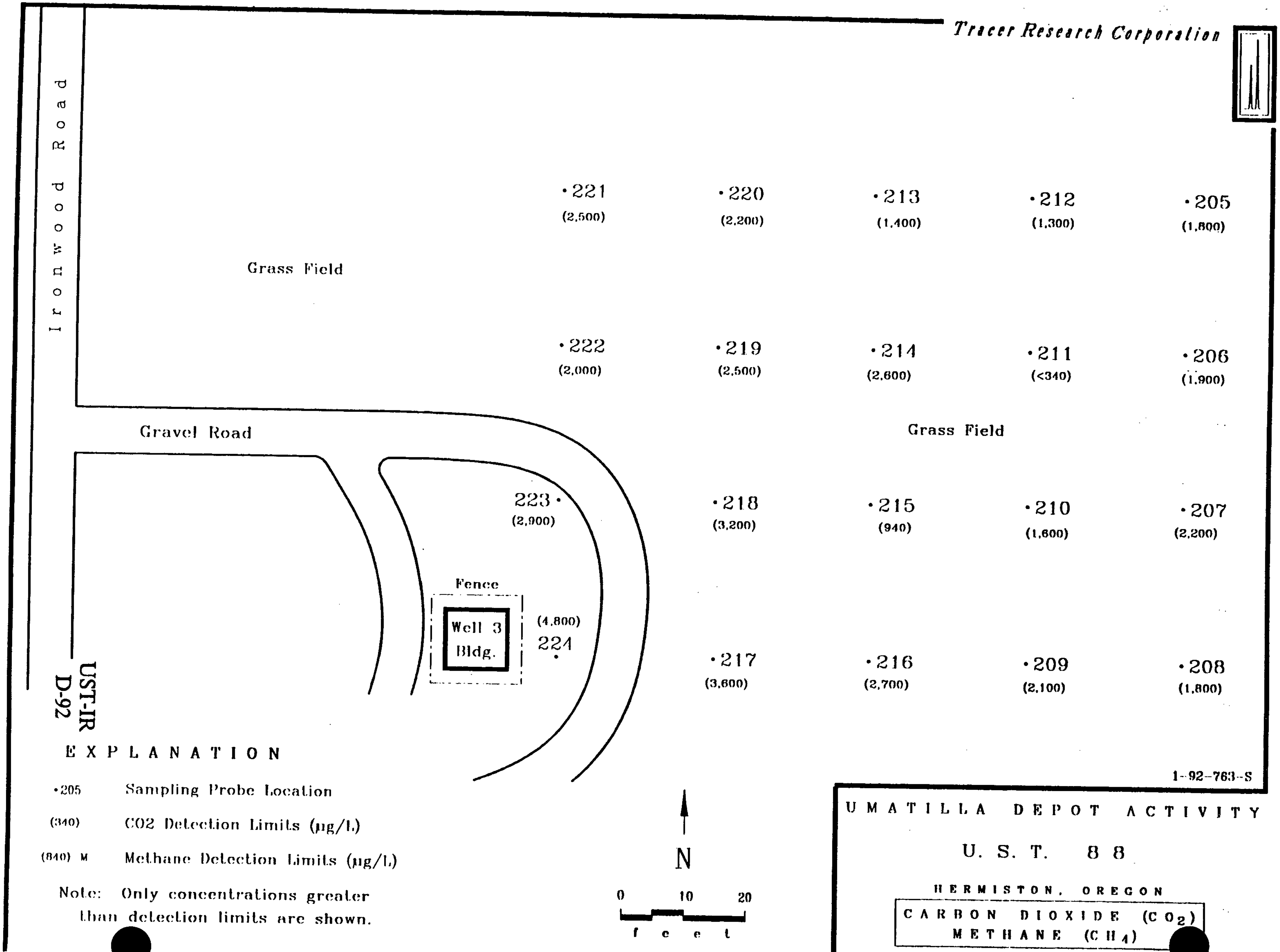
HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 14a

EXPLANATION

•205 Sampling Probe Location



UST-IR
D-92

EXPLANATION

•205 Sampling Probe Location

(340) CO2 Detection Limits (μg/L)

(840) M Methane Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

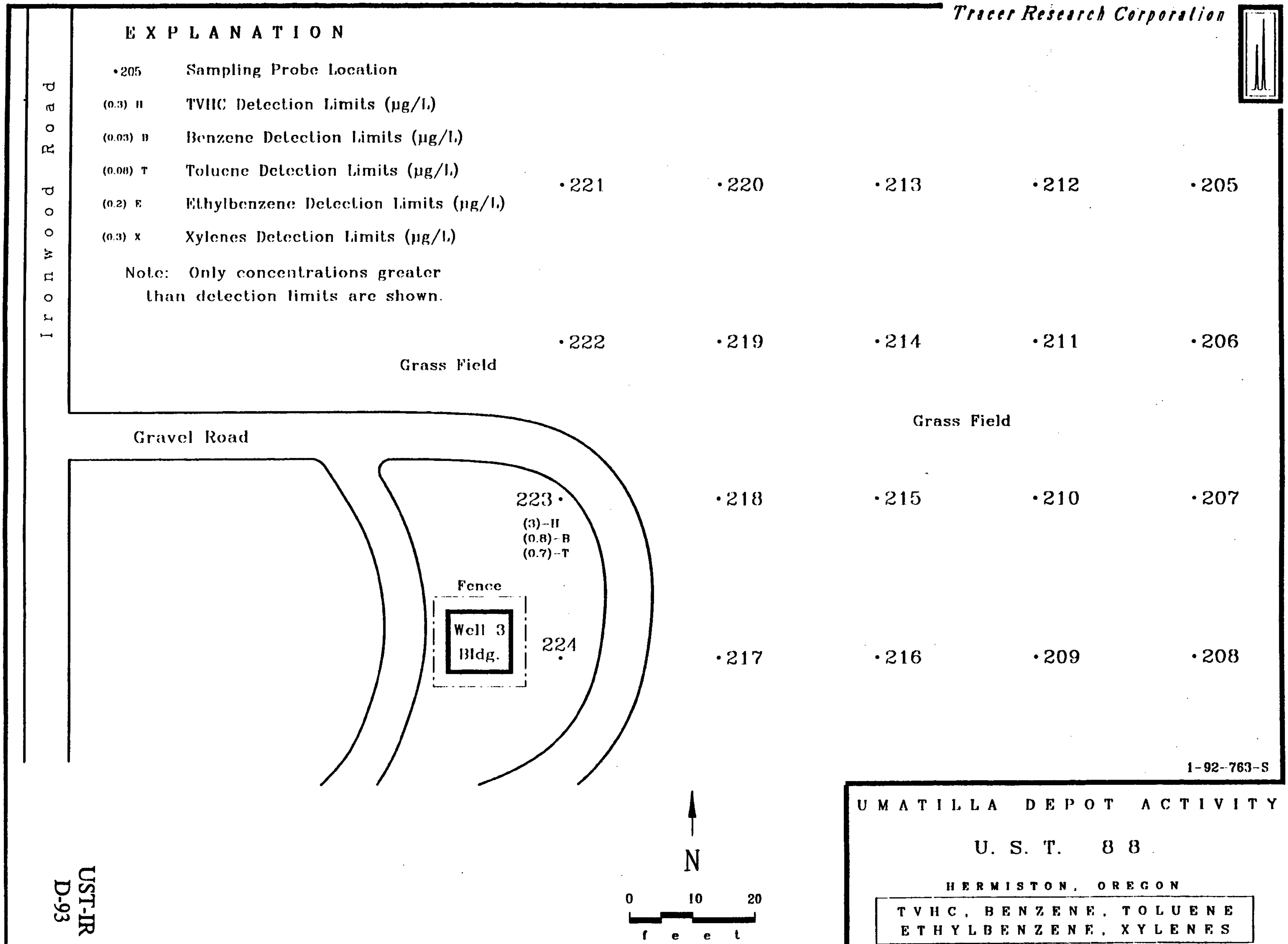
UMATILLA DEPOT ACTIVITY

U. S. T. 88

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 14b



UMATILLA DEPOT ACTIVITY

U. S. T. 88

HERMISTON, OREGON

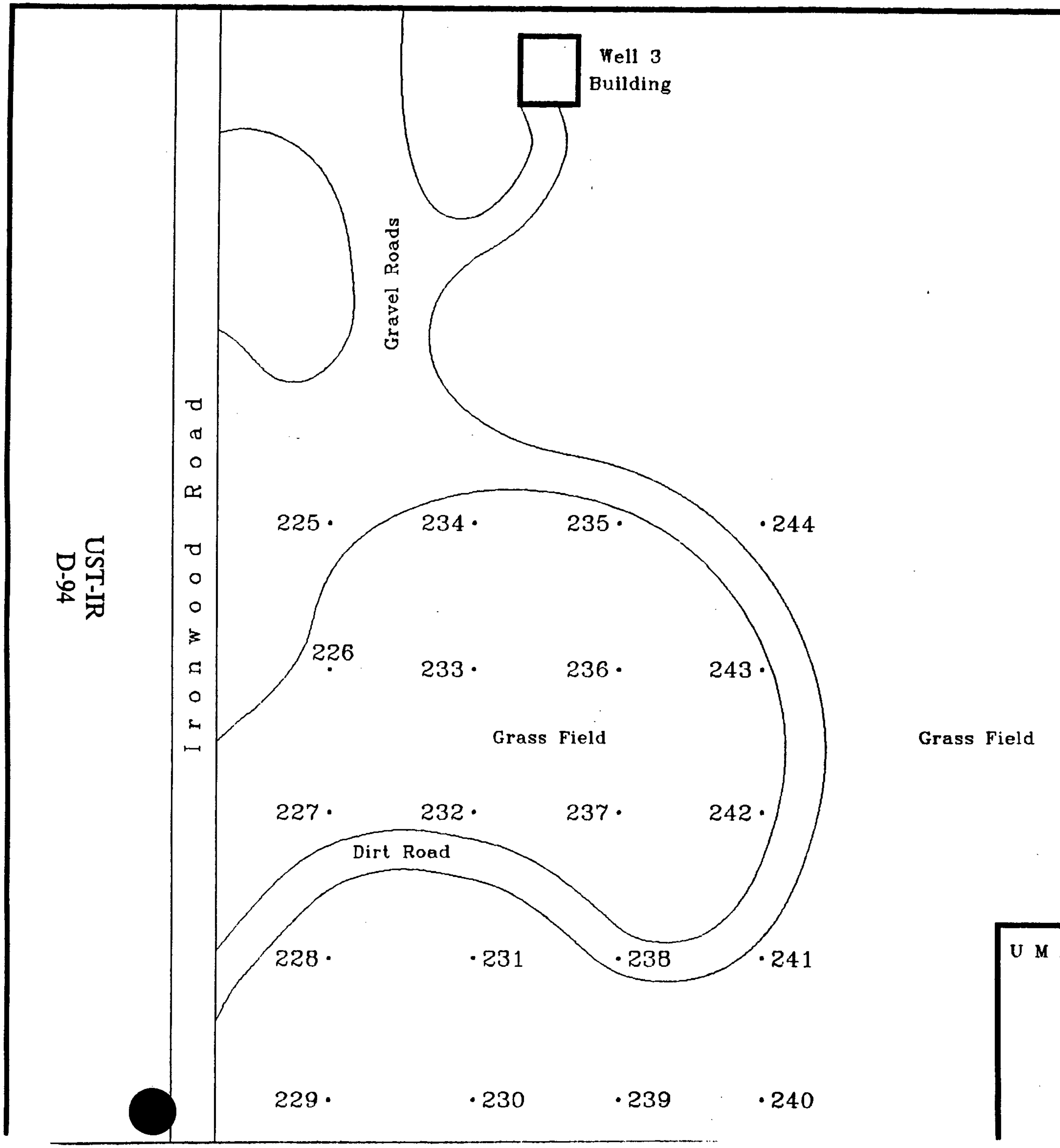
TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 14c

Tracer Research Corporation

EXPLANATION

•225 Sampling Probe Location



1-92-763-S

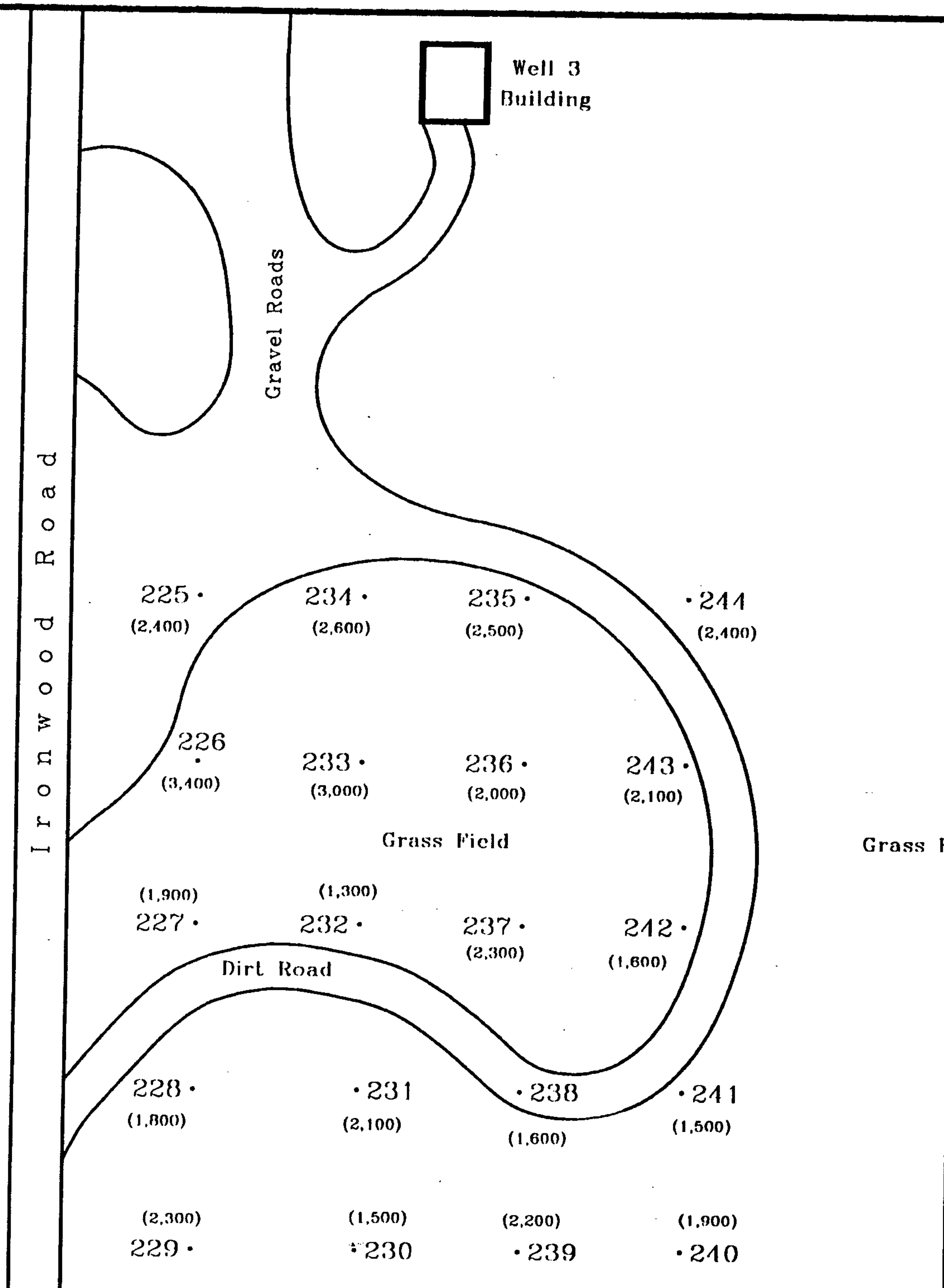
UMATILLA DEPOT ACTIVITY

U. S. T. 89

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 15a



Tracer Research Corporation

E X P L A N A T I O N

•225	Sampling Probe Location
(340)	CO2 Detection Limits (μg/L)
(870)-M	Methane Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

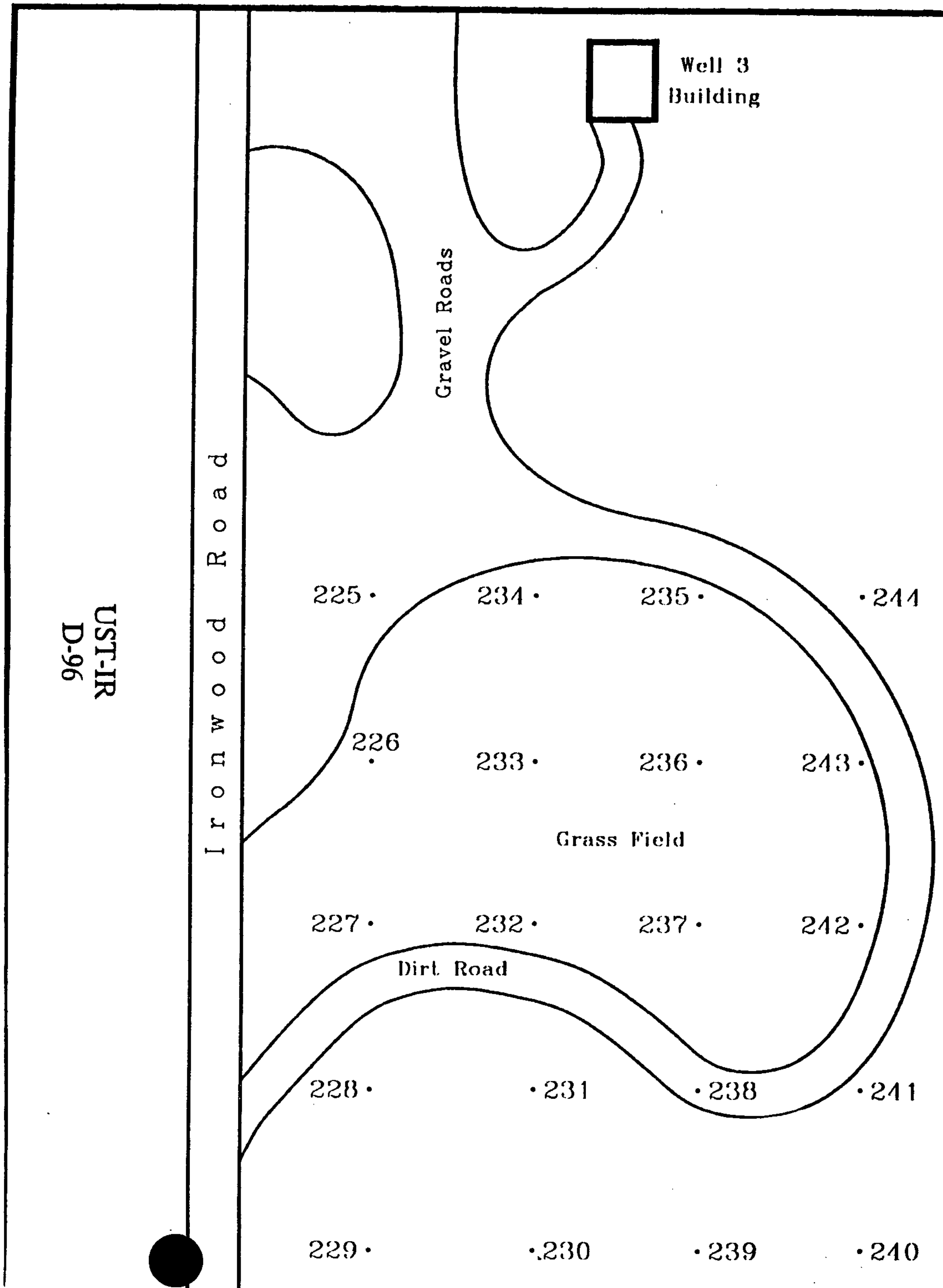
U M A T I L L A   D E P O T   A C T I V I T Y

U. S. T. 89

H E R M I S T O N ,   O R E G O N

C A R B O N   D I O X I D E (CO_2)
M E T H A N E (CH_4)

Figure 15b



Tracer Research Corporation

EXPLANATION

•225	Sampling Probe Location
(0.3)-H	TVHC Detection Limits (µg/L)
(0.03)-B	Benzene Detection Limits (µg/L)
(0.08)-T	Toluene Detection Limits (µg/L)
(0.2)-E	Ethylbenzene Detection Limits (µg/L)
(0.3)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

Grass Field

N

0 25
feet

1-92-763-S

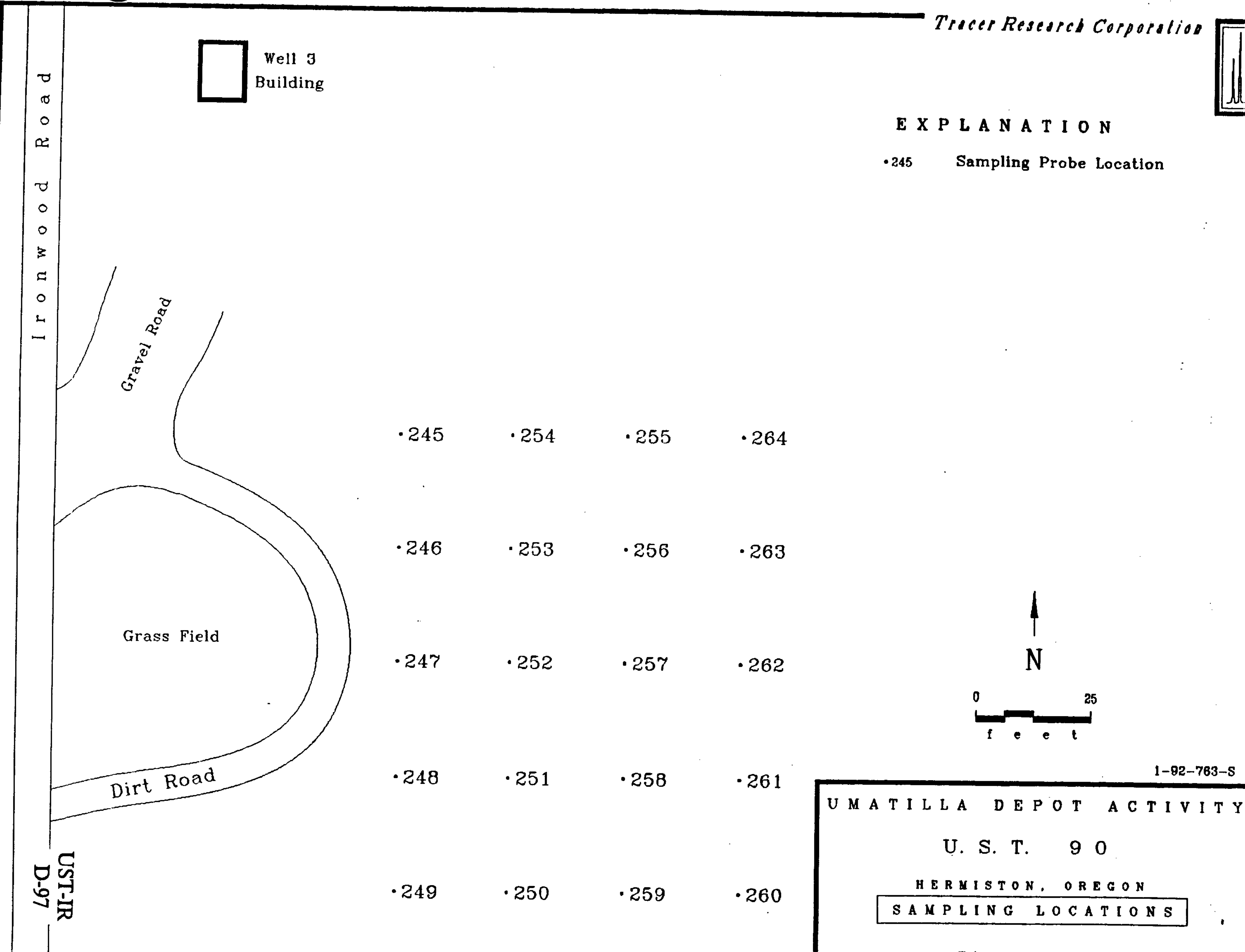
UMATILLA DEPOT ACTIVITY

U. S. T. 89

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLE

Tracer Research Corporation



UMATILLA DEPOT ACTIVITY

U. S. T. 90

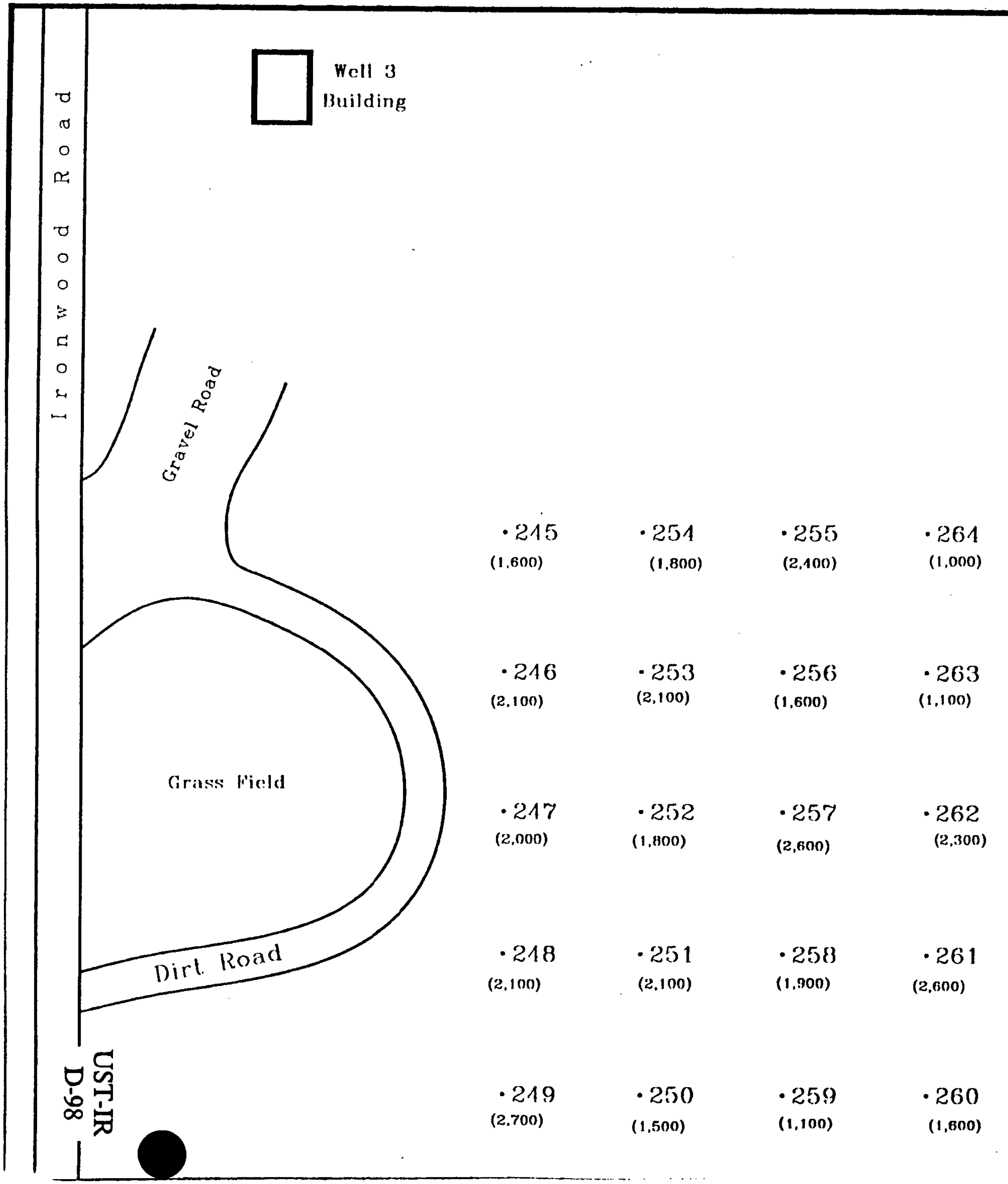
HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 18a

UST-IR
D-97

Tracer Research Corporation



EXPLANATION

•245	Sampling Probe Location
(310)	CO2 Detection Limits (µg/L)
(870)-M	Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

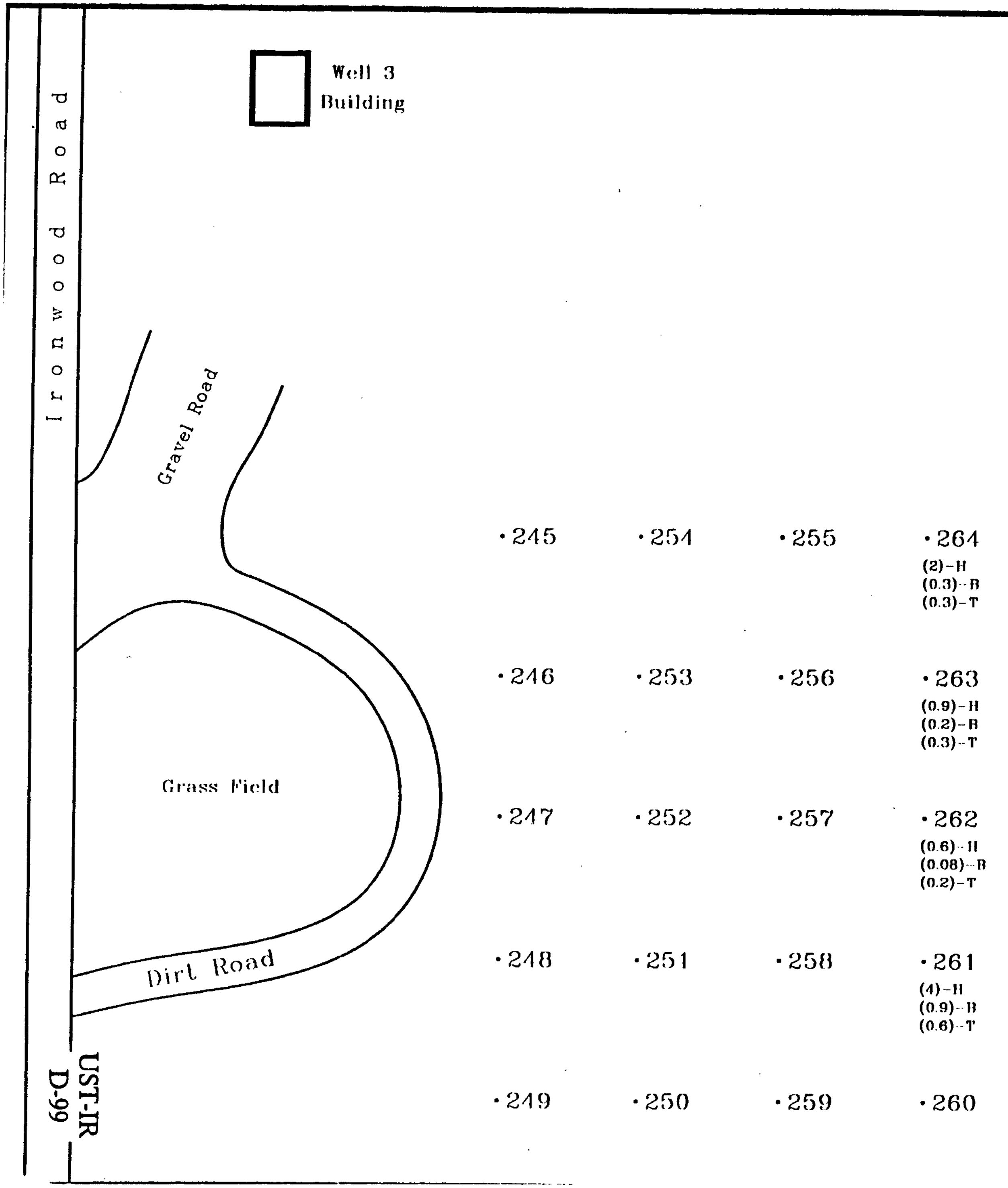
UMATILLA DEPOT ACTIVITY

U. S. T. 90

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 16b



Tracer Research Corporation

EXPLANATION

•245	Sampling Probe Location
(0.3)–H	TVHC Detection Limits (μg/L)
(0.04)–B	Benzene Detection Limits (μg/L)
(0.09)–T	Toluene Detection Limits (μg/L)
(0.2)–E	Ethylbenzene Detection Limits (μg/L)
(0.3)–X	Xylenes Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

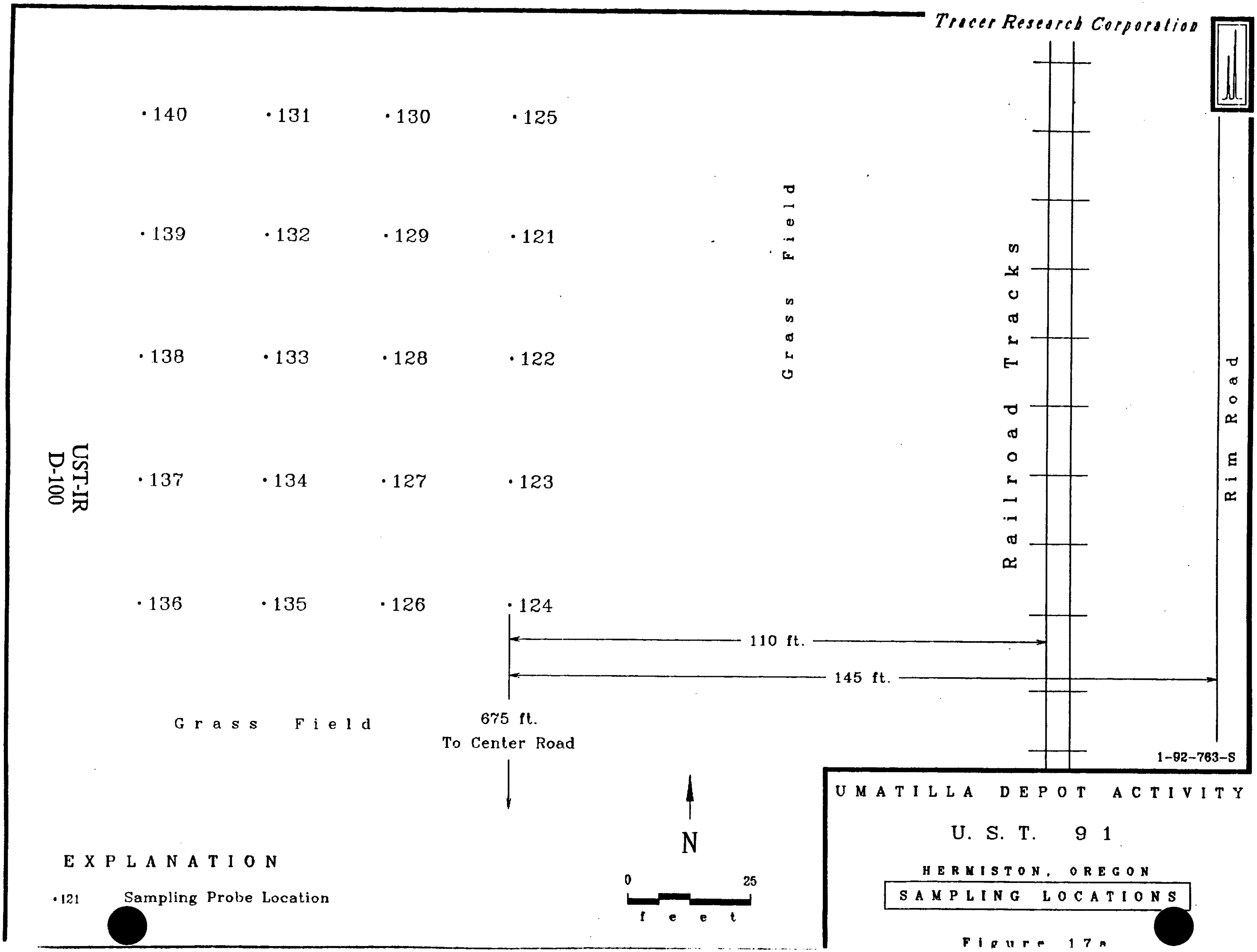
UMATILLA DEPOT ACTIVITY

U. S. T. 90

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 16c



UMATILLA DEPOT ACTIVITY

U. S. T. 91

HERMISTON, OREGON

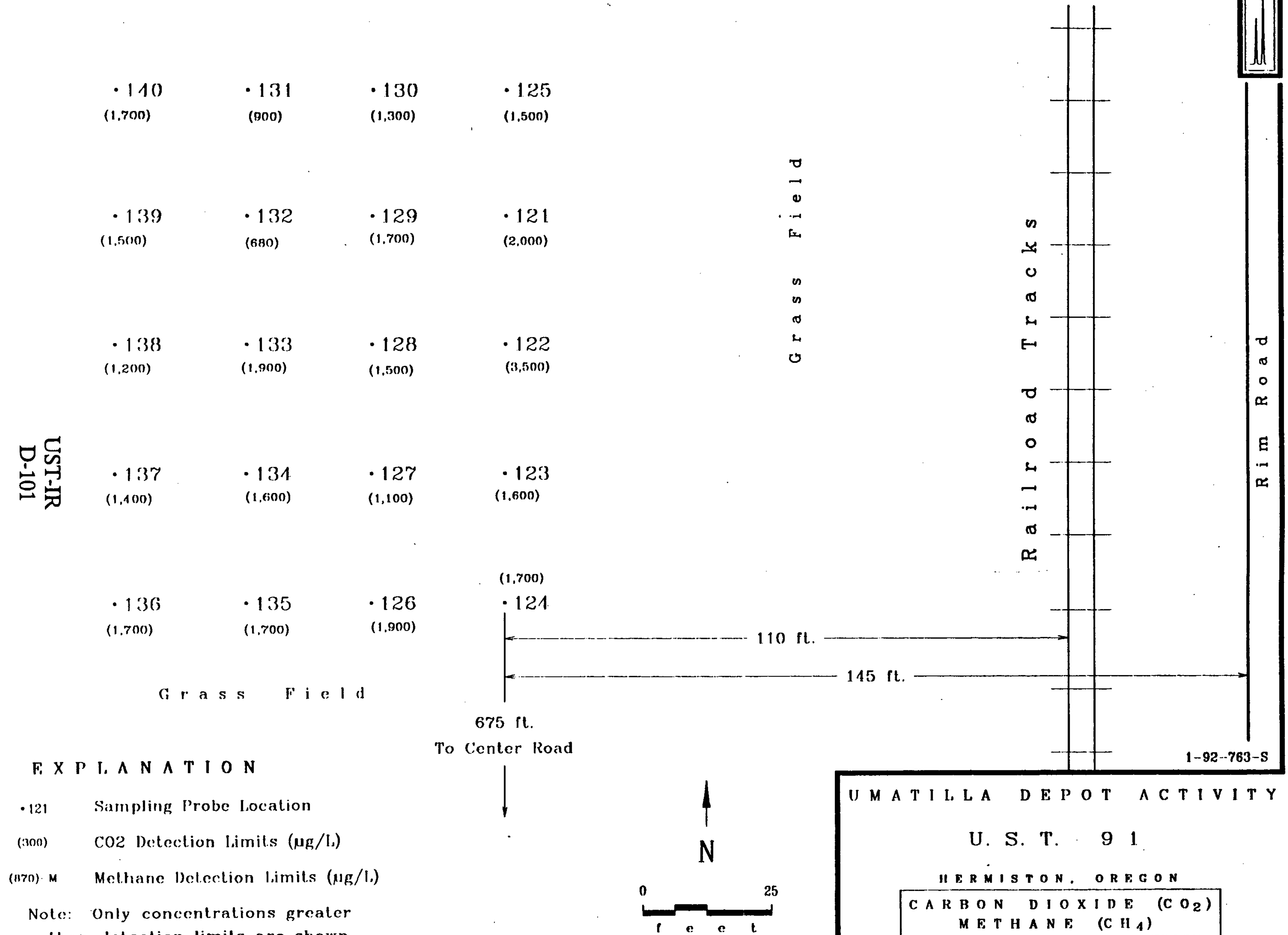
SAMPLING LOCATIONS

Figure 17a

UST-IR
D-100

Tracer Research Corporation

UST-IR
D-101



EXPLANATION

•121 Sampling Probe Location

(300) CO2 Detection Limits (µg/L)

(870) M Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

UMATILLA DEPOT ACTIVITY

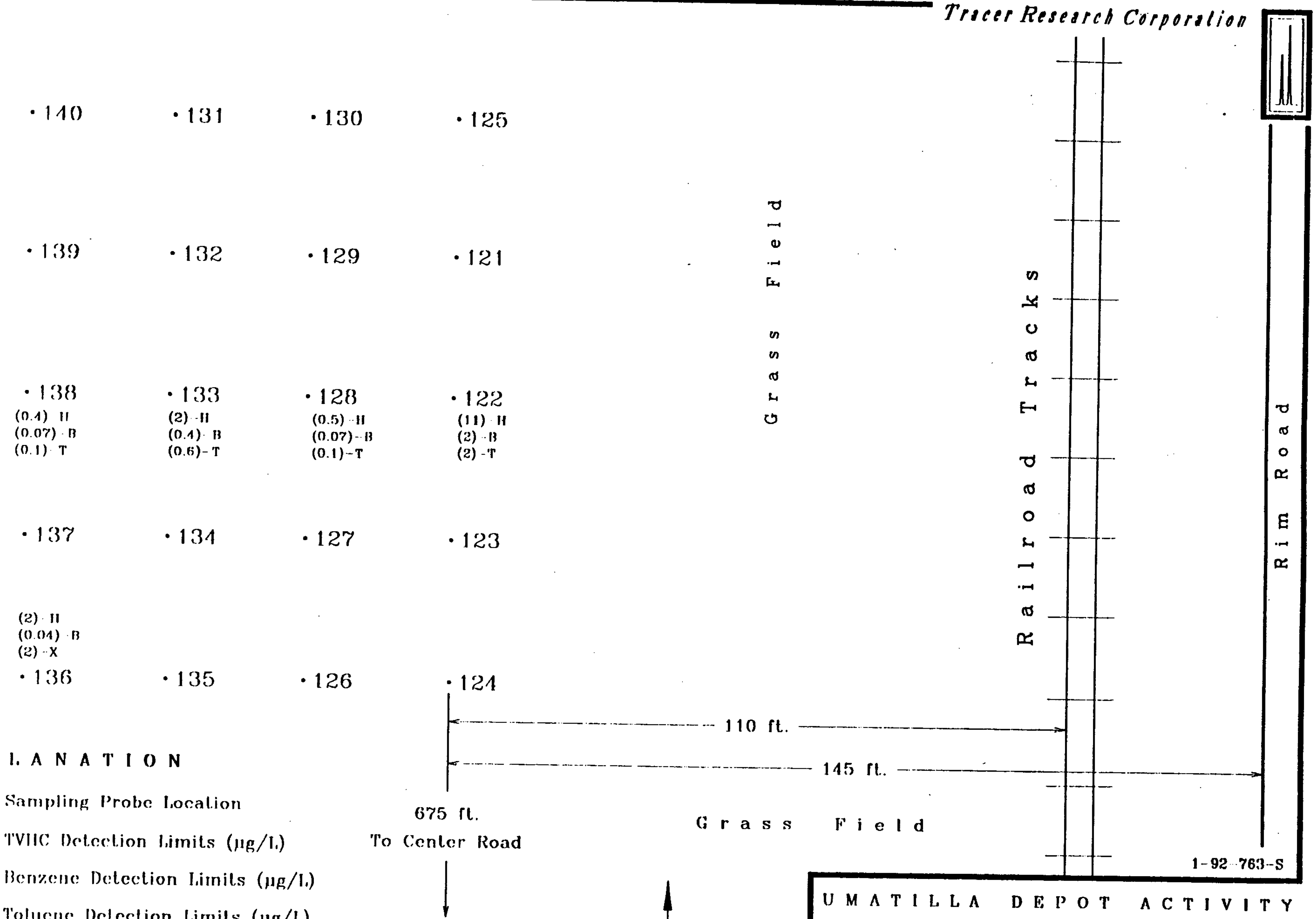
U. S. T. 91

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 17b

Tracer Research Corporation



UST-IR
D-102

E X P L A N A T I O N

•121 Sampling Probe Location

(0.2) H TVHC Detection Limits (μg/L)

(0.02) B Benzene Detection Limits (μg/L)

(0.05) T Toluene Detection Limits (μg/L)

(0.1) E Ethylbenzene Detection Limits (μg/L)

(0.2) X Xylenes Detection Limits (μg/L)

Note: Only concentrations greater than detection limits are shown.

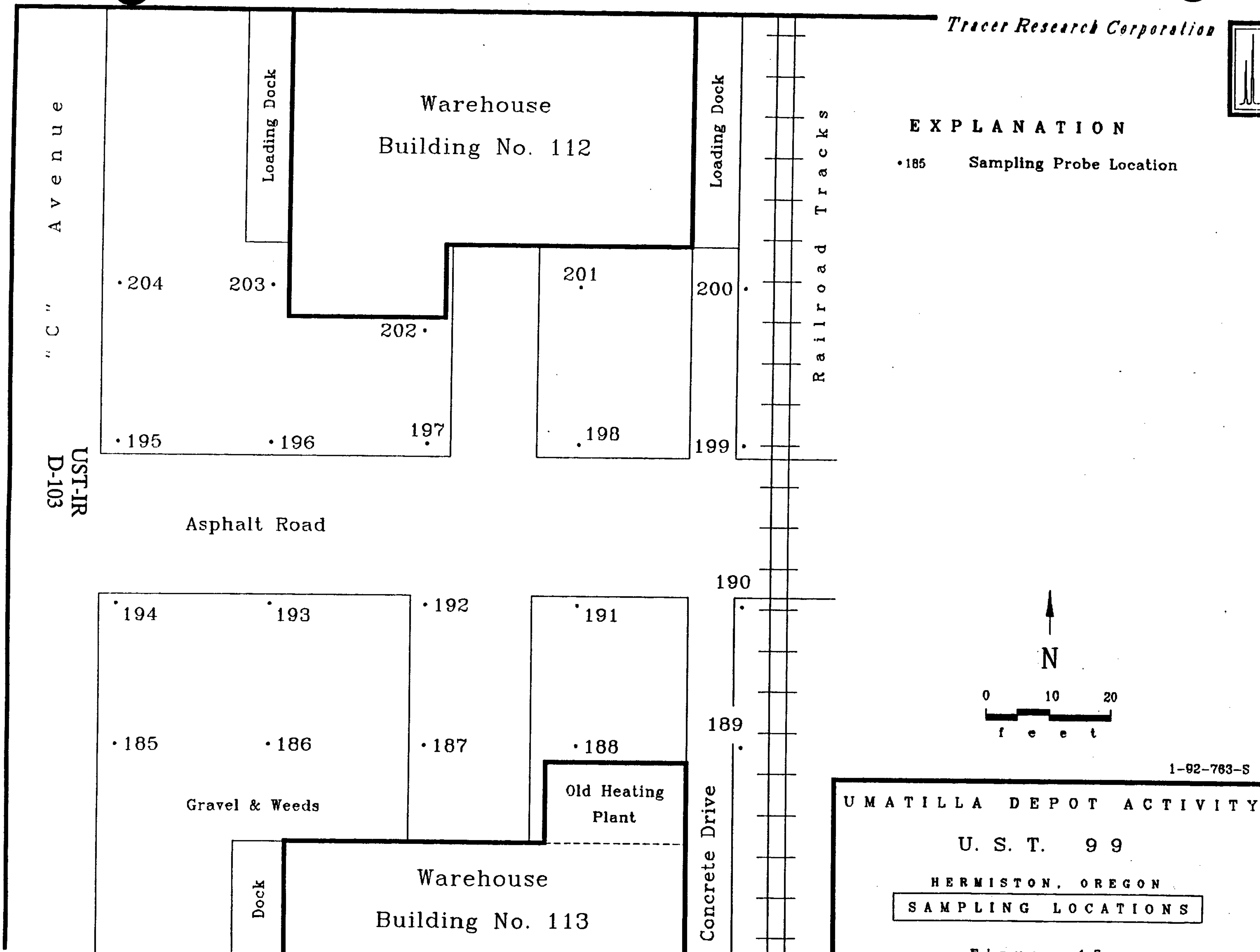
UMATILLA DEPOT ACTIVITY

U. S. T. 91

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENE

Figure 17



Tracer Research Corporation

1-92-763-S

UMATILLA DEPOT ACTIVITY

U. S. T. 99

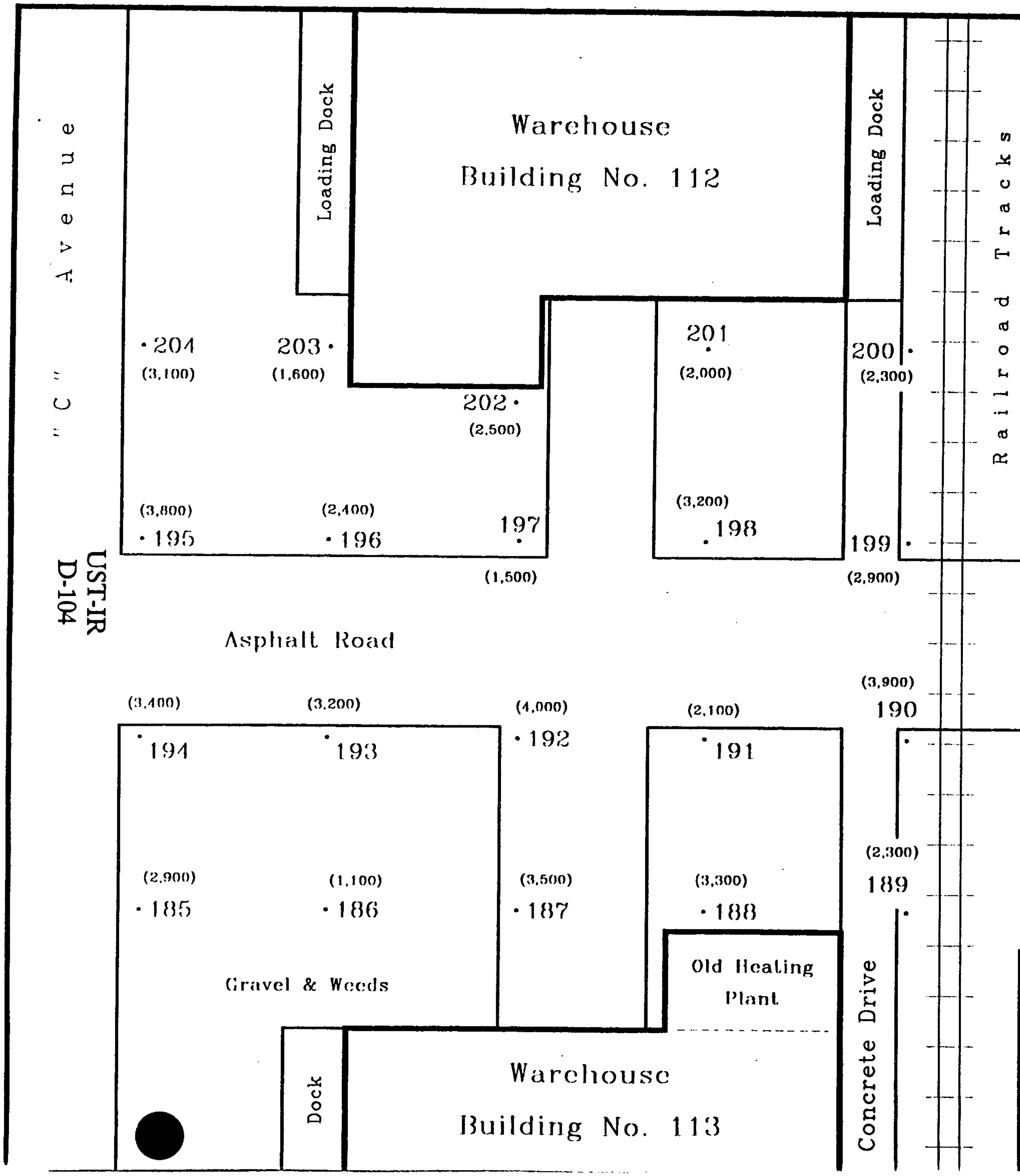
HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 18a

UST-IR
D-103

Tracer Research Corporation



UST-IR
D-104

EXPLANATION

•185 Sampling Probe Location

(340) CO2 Detection Limits (µg/L)

(840)-M Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

UMATILLA DEPOT ACTIVITY

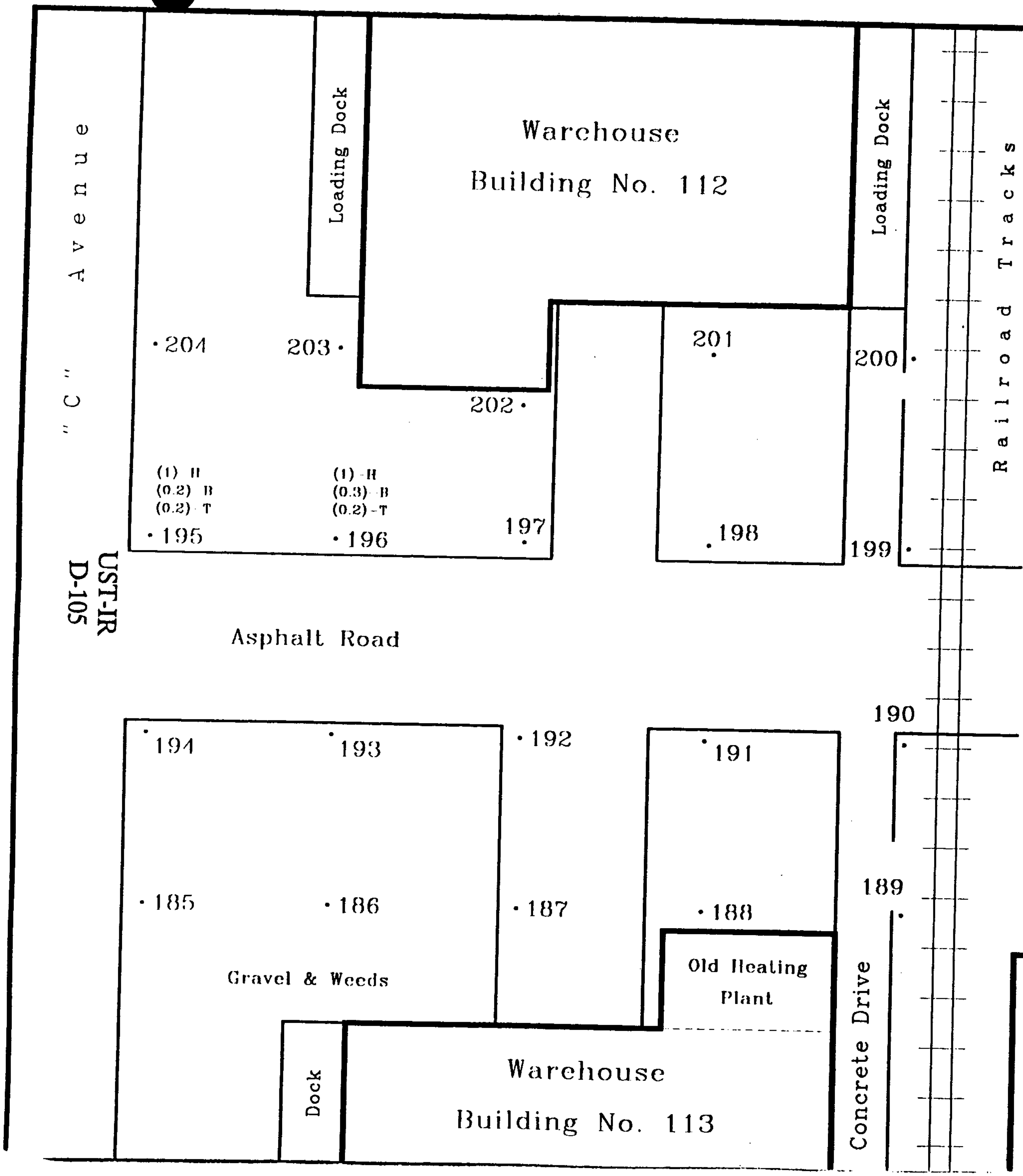
U. S. T. 99

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 18b

Tracer Research Corporation



UST-IR
D-105

EXPLANATION

•185	Sampling Probe Location
(0.3)-H	TVHC Detection Limits (µg/L)
(0.03)-B	Benzene Detection Limits (µg/L)
(0.08)-T	Toluene Detection Limits (µg/L)
(0.2)-E	Ethylbenzene Detection Limits (µg/L)
(0.3)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

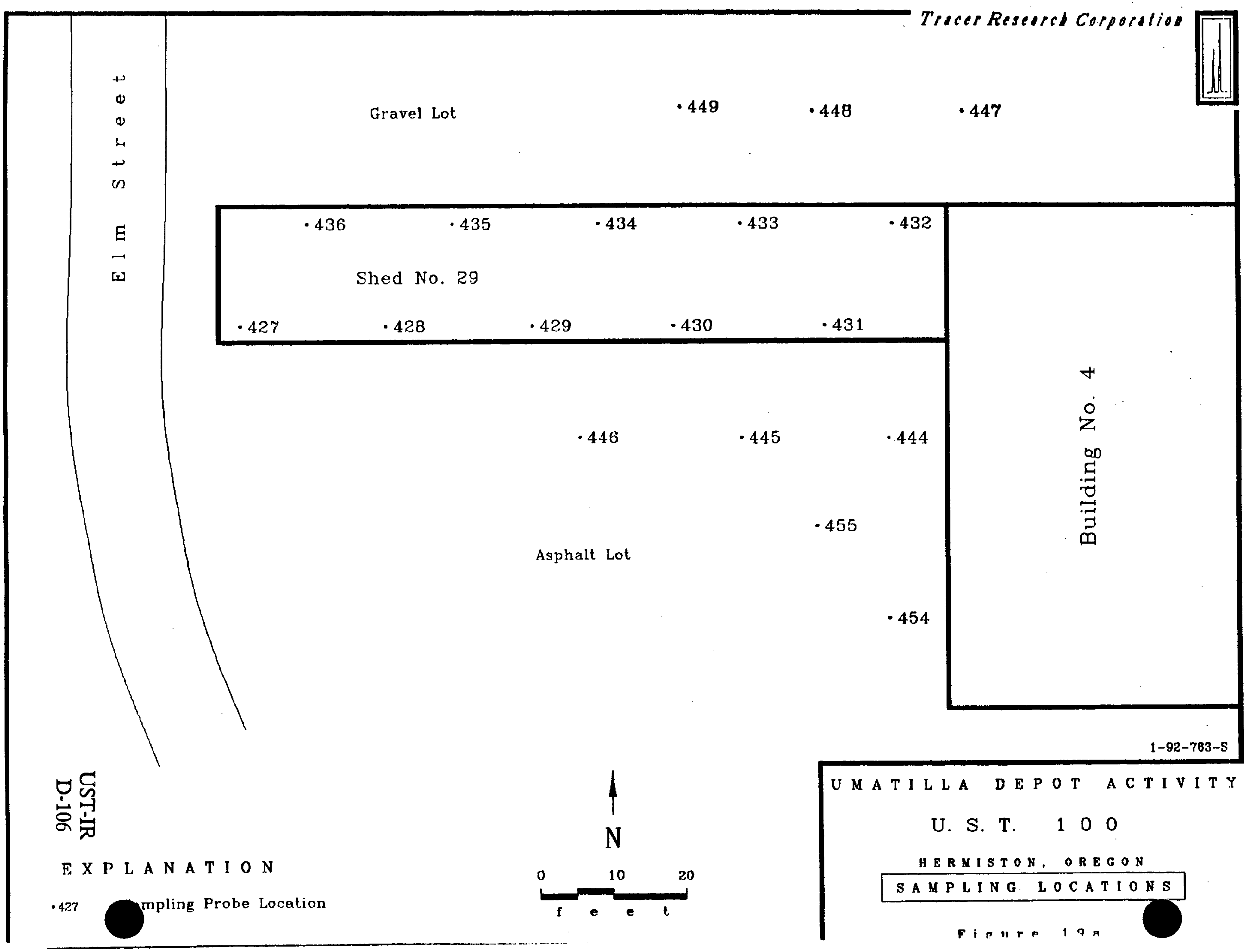
UMATILLA DEPOT ACTIVITY

U. S. T. 99

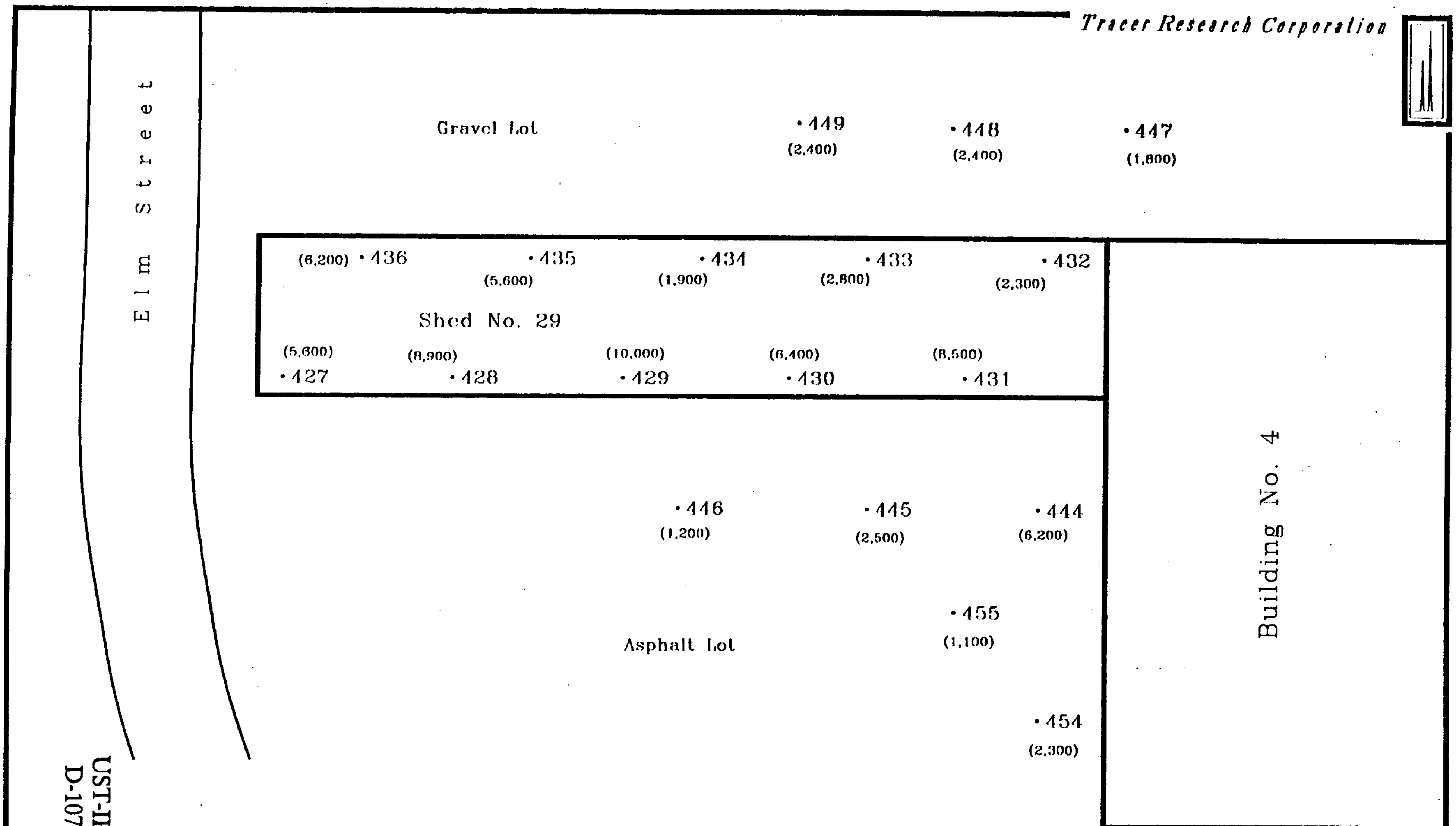
HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 18c



Tracer Research Corporation
Elm Street
Gravel Lot
•449
•448
•447
•436
•435
•434
•433
•432
Shed No. 29
•427
•428
•429
•430
•431
Building No. 4
•446
•445
•444
•455
Asphalt Lot
•454
1-92-763-S
UMATILLA DEPOT ACTIVITY
U. S. T. 100
HERMISTON, OREGON
SAMPLING LOCATIONS
Figure 19a
UST-IR
D-106
EXPLANATION
•427 Sampling Probe Location
N
0
10
20
feet



UST-IR
D-107

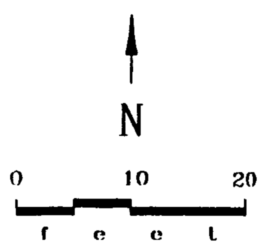
EXPLANATION

•427 Sampling Probe Location

(310) CO2 Detection Limits (µg/L)

(790) M Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.



1-92-763-S

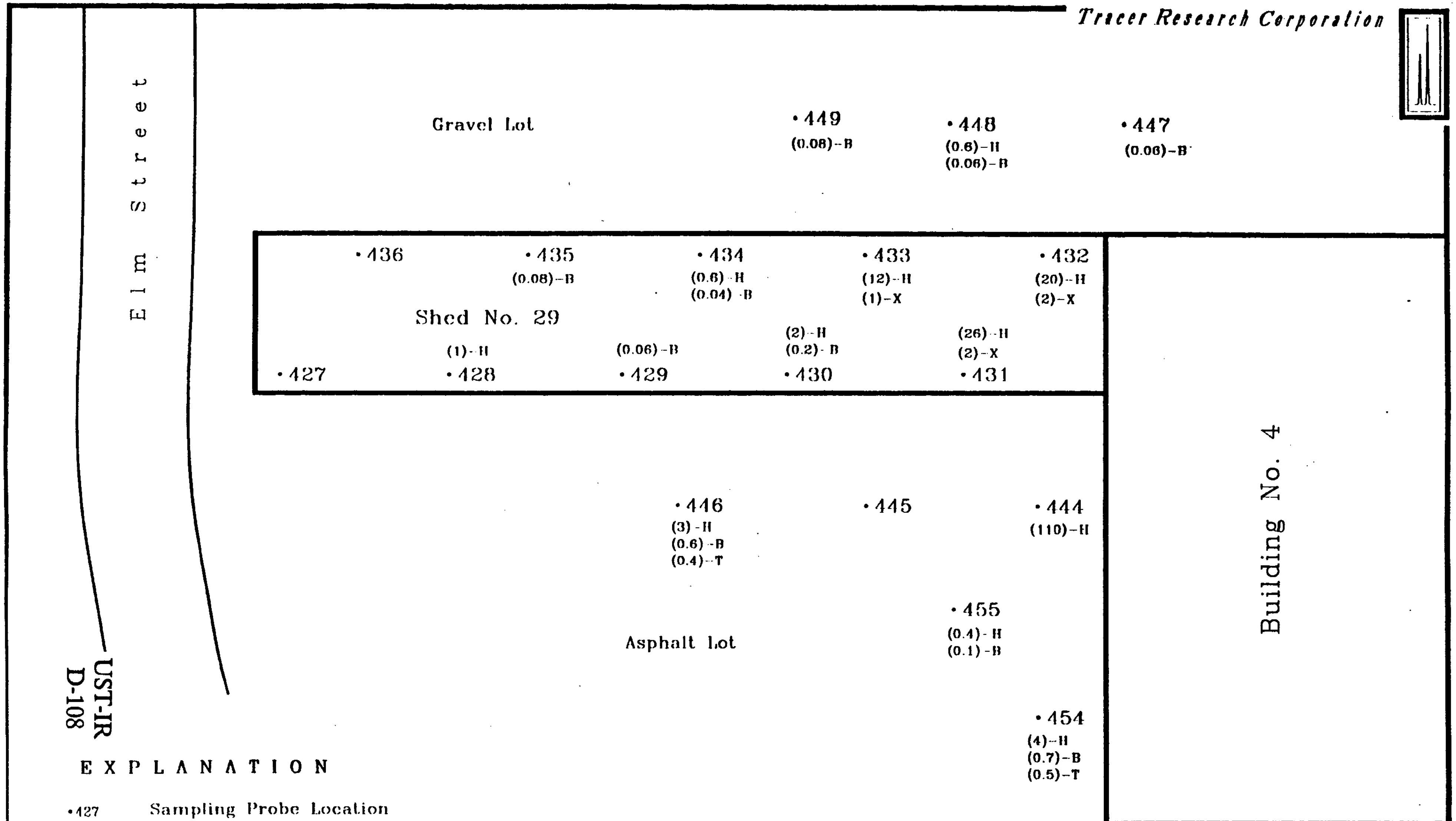
UMATILLA DEPOT ACTIVITY

U. S. T. 100

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

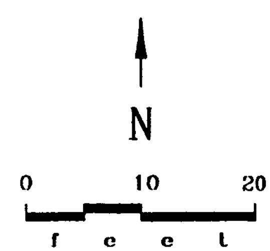
Figure 19b



EXPLANATION

•427	Sampling Probe Location
(0.4) H	TVHC Detection Limits (µg/L)
(0.04) B	Benzene Detection Limits (µg/L)
(0.1) T	Toluene Detection Limits (µg/L)
(0.3) E	Ethylbenzene Detection Limits (µg/L)
(0.4) X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater th[illegible] detection limits are shown.



UMATILLA DEPOT ACTIVITY

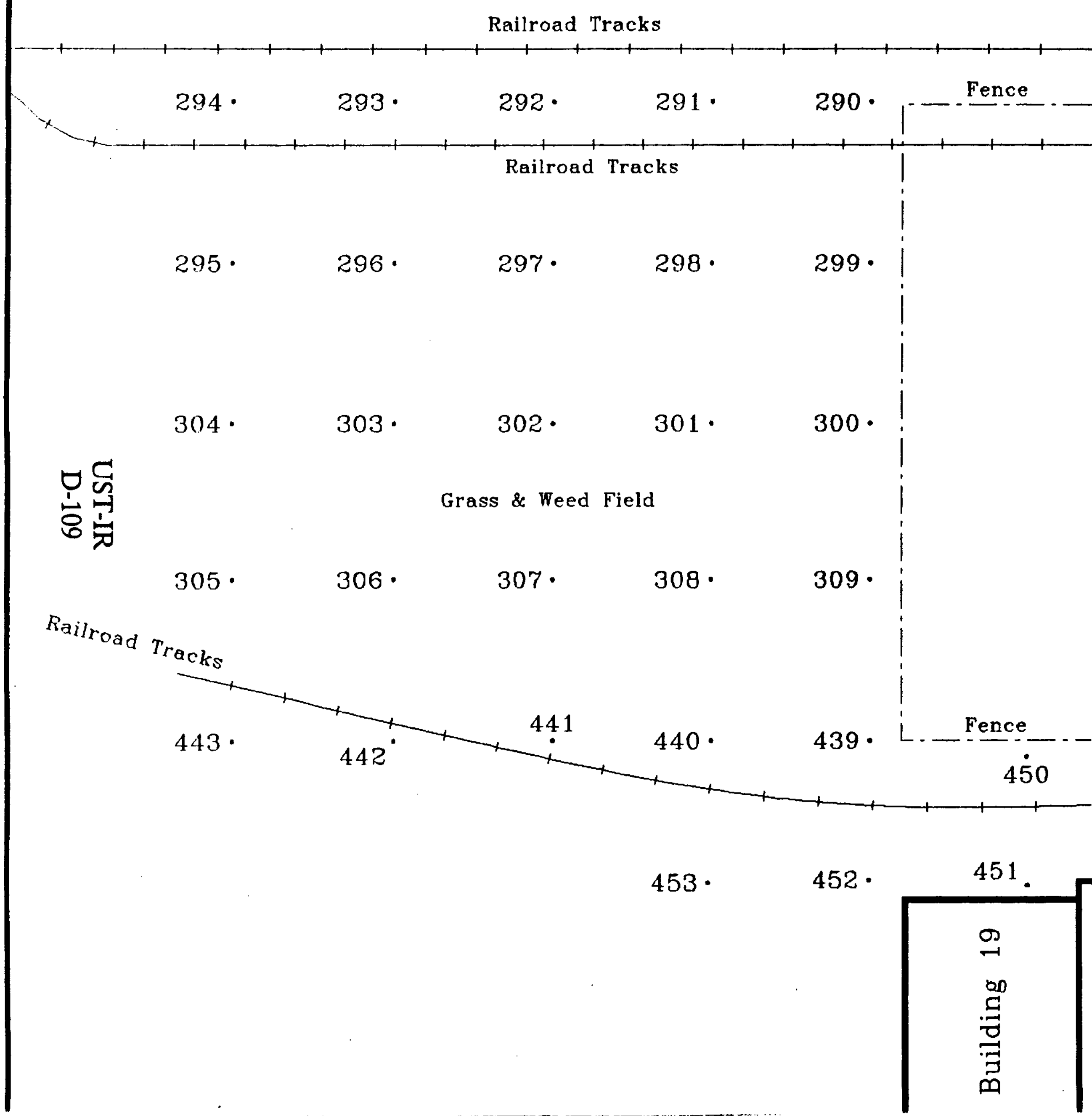
U. S. T. 100

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLE[illegible]S

Figure 19c

Tracer Research Corporation



UST-IR
D-109

EXPLANATION

•290 Sampling Probe Location

1-92-763-S

UMATILLA DEPOT ACTIVITY

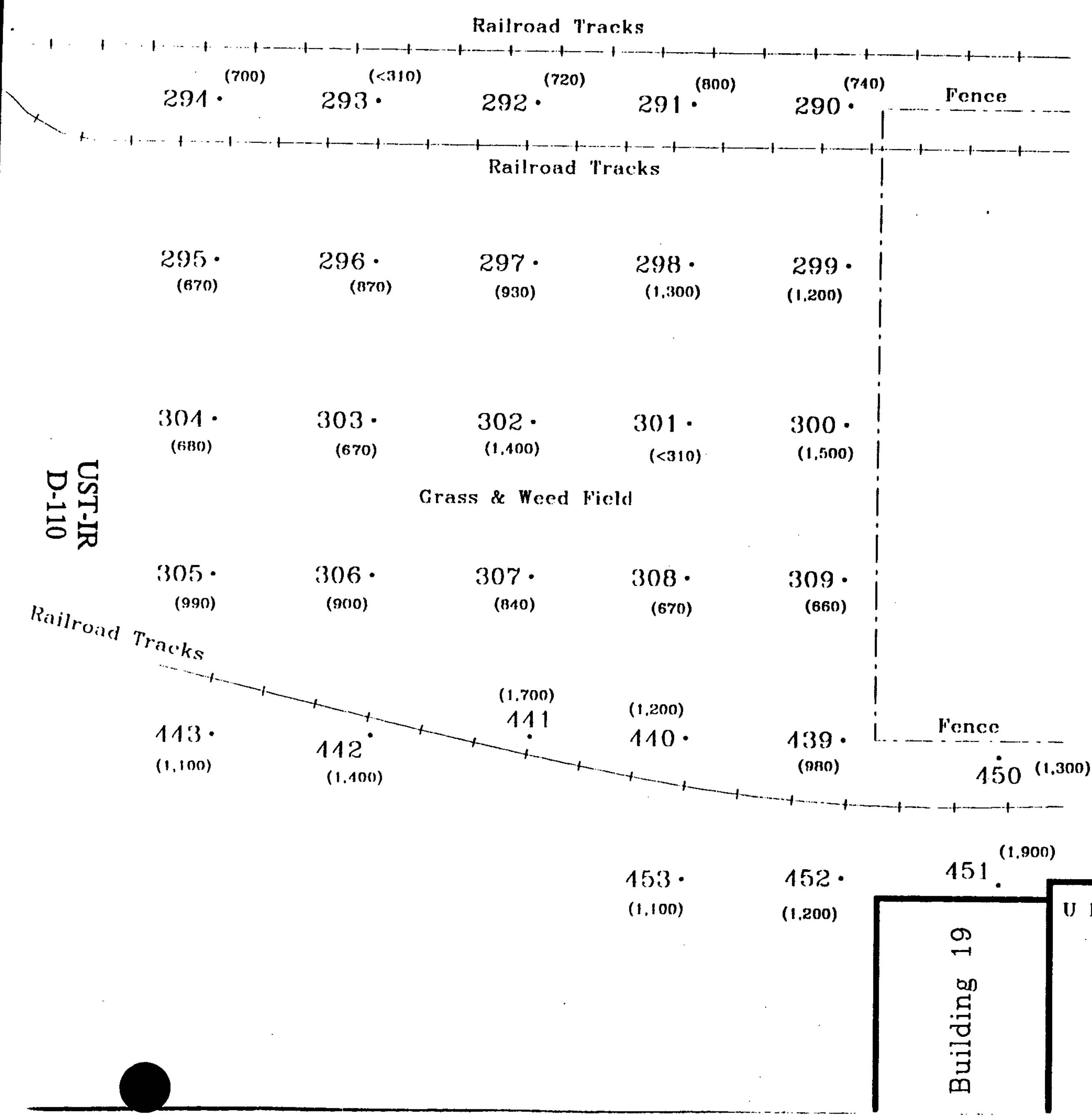
U. S. T. 102

HERMISTON, OREGON

SAMPLING LOCATIONS

Figure 20a

Tracer Research Corporation



UST-IR
D-110

EXPLANATION

•290	Sampling Probe Location
(310)	CO2 Detection Limits (µg/L)
(680)-M	Methane Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

1-92-763-S

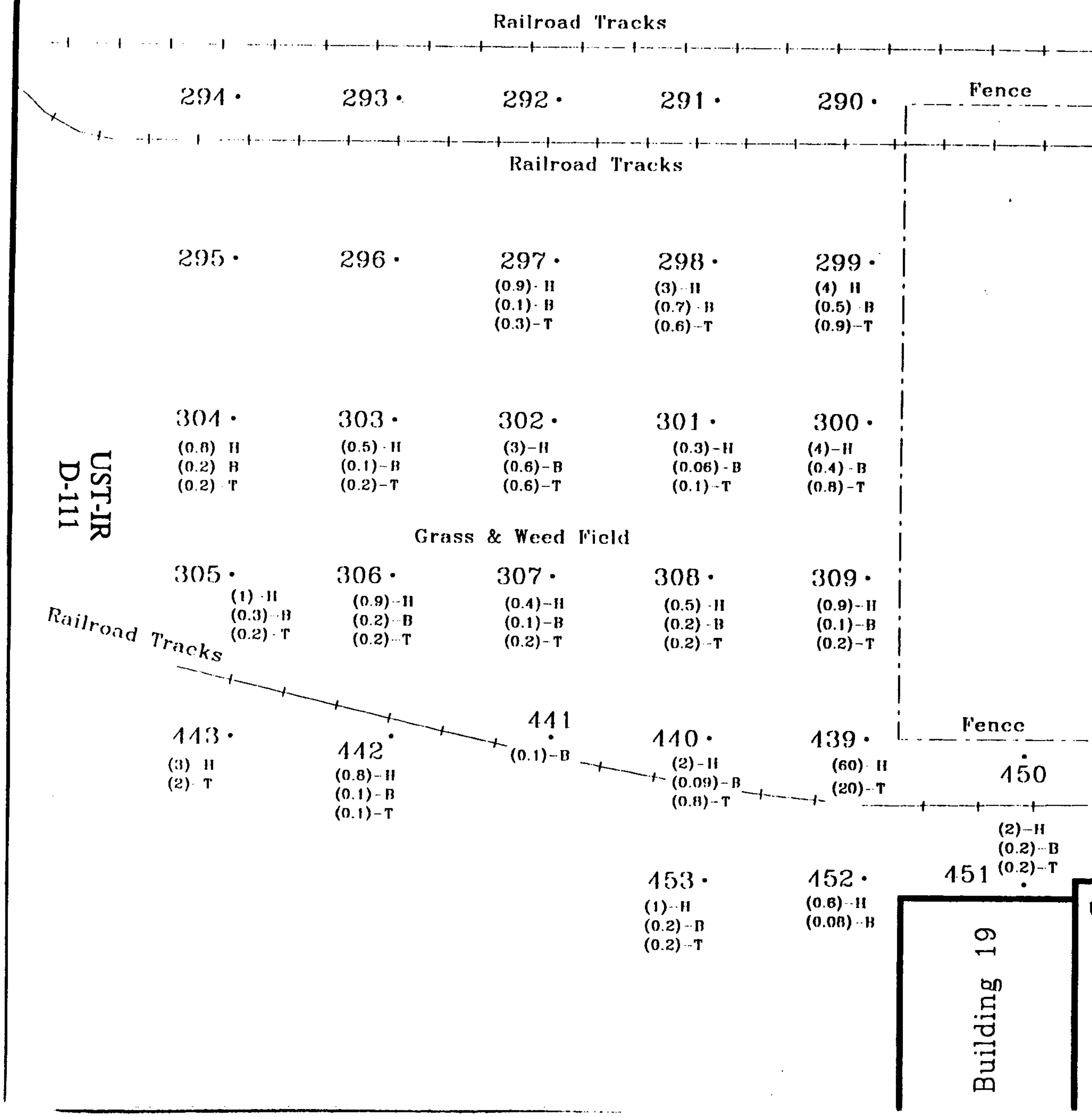
UMATILLA DEPOT ACTIVITY

U. S. T. 102

HERMISTON, OREGON

CARBON DIOXIDE (CO_2)
METHANE (CH_4)

Figure 20b



UST-IR
D-111

E X P L A N A T I O N

•290	Sampling Probe Location
(0.3)-H	TVHC Detection Limits (µg/L)
(0.04)-B	Benzene Detection Limits (µg/L)
(0.1)-T	Toluene Detection Limits (µg/L)
(0.2)-E	Ethylbenzene Detection Limits (µg/L)
(0.3)-X	Xylenes Detection Limits (µg/L)

Note: Only concentrations greater than detection limits are shown.

N

0 25
feet

1-92-763-S

UMATILLA DEPOT ACTIVITY

U. S. T. 102

HERMISTON, OREGON

TVHC, BENZENE, TOLUENE
ETHYLBENZENE, XYLENES

Figure 20c

Tracer Research Corporation appreciates the opportunity of being of service to your organization. Because we are constantly striving to improve our service to you, we welcome any comments or suggestions you may have about how we can be more responsive to the needs of your organization.

This soil gas report was prepared by Karen McWhirter. If you have any questions about the field work, analytical results, or this report, please give Karen a call at (602) 888-9400.

APPENDIX E

Northeast Research Institute, Inc.
Passive Soil Gas Survey Report

NORTHEAST RESEARCH INSTITUTE, INC.

FINAL REPORT ON THE FINDINGS OF THE
PETREX SOIL GAS SURVEY CONDUCTED FOR
DAMES & MOORE, INC.
AT SITE 74 OF THE
UMATILLA ARMY DEPOT
LOCATED IN HERMISTON, OREGON

PREPARED BY: DATE:

Will Maslanik 12-1-92

Will Maslanik, Project Manager

APPROVED BY: DATE:

Phil Harrington for Jim Viellenave 12/1/92

James H. Viellenave, Vice President

NORTHEAST RESEARCH INSTITUTE, INC.
605 PARFET STREET, SUITE 100
LAKEWOOD, COLORADO 80215
(303) 238-0090

DECEMBER 1, 1992

R1725JG2/11.30.92

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NERI
NORTHEAST RESEARCH INSTITUTE, INC.

1.0 EXECUTIVE SUMMARY

Northeast Research Institute, Inc. (NERI) recently performed a PETREX Soil Gas Survey for Dames & Moore, Inc. at Site 74 of the Umatilla Army Depot located in Hermiston, Oregon.

The purpose of the PETREX soil gas survey was to determine if volatile organic compounds and semivolatile organic compounds are present in the subsurface.

The chlorinated compounds tetrachloroethene (PCE), trichloroethene (TCE), as well as petroleum hydrocarbons benzene, toluene, xylenes/ethylbenzene (BTXE) have been identified onsite. The distributions of the compound occurrences have been mapped and are shown on Plates 2-4. The areal extent of PCE and TCE migration extend beyond the survey boundaries to the east and northeast. BTXE occurrence appears to be confined to the site.

2.0 INTRODUCTION

Northeast Research Institute, Inc. (NERI) recently performed a PETREX soil gas survey for Dames & Moore, Inc. at Site 74 of the Umatilla Army Depot located in Hermiston, Oregon. Site 74 previously operated as a fuel transfer station. Petroleum products are suspected to be present as subsurface contamination, however additional VOCs may be present. This survey was Phase I of a two phase project.. Phase I was performed in order to provide an overview of the site condition, the second phase will be conducted to investigate areas of interest identified by Phase I.

3.0 OBJECTIVES

The purpose of the PETREX soil gas survey was to:

1. Identify volatile organic compounds (VOCs) and semivolatile organic compounds (SVOCs) which may indicate subsurface contamination.

2. Map the distribution of the compounds detected to define potential source areas, migration pathways, and aid in determining the areal extent of chemical migration.

4.0 SURVEY DESIGN AND FIELD METHODS

4.1 Survey Design

Thirty two (32) PETREX soil gas samplers were placed in a regular grid pattern on 50 foot intervals throughout the site. See Plate 1 for sampling locations.

4.2 Field Operations

Sampler installation was conducted on September 15, 1992.

The samplers were placed in direct contact with the soil at the bottom of a 12 inch deep borehole. The borehole was then backfilled and the samplers were allowed to equilibrate with the soil gas.

Sampler exposure time was determined by the use of six time calibration samplers (time tests). Time test samplers were installed concurrent with the survey sampler installation and removed for analysis following a 7 day exposure period. The purpose of the time test samplers was to assess the loading rate of VOCs and SVOCs onto the PETREX collector. Based upon the analysis of the time calibration sample, a 15 day exposure period was determined to be sufficient. Sampler retrieval was subsequently performed by NERI on September 30, 1992.

A detailed description of the protocols followed in the preparation, installation, handling, and analysis of the PETREX soil gas sampler is included in this report as Appendix A.

5.0 ANALYSIS QA/QC

Each sampler contained two PETREX collectors. One collector from each sample was analyzed by Curie-point Desorption Mass Spectrometry (TD/MS). The second collector was reserved for analysis by Curie-point Desorption Gas Chromatography/Mass Spectrometry (TD-GC/MS). GC/MS analysis of the PETREX collector allowed a higher degree of resolution between compounds detected in the soil gas in addition to enhanced compound identification. Four (4) samples were analyzed by GC/MS analysis as part of the Phase I investigation.

Selected QA/QC samplers were analyzed to ensure that they were contaminant free before the samplers used in the field were released from the PETREX lab. Transportation blanks were also provided for both collector installation and retrieval. No compounds were detected above background except normal atmospheric compounds on the QA/QC collectors (including blanks). Quality assurance was also maintained in the PETREX lab during analysis.

A detailed description of the PETREX QA/QC may be found in the PETREX Protocol located in Appendix A.

6.0 RESULTS

The chlorinated solvents, tetrachloroethene (PCE) and trichloroethene (TCE) and the petroleum hydrocarbon compounds benzene, toluene, xylenes/ethylbenzene (BTXE) have been detected in the soil gas. The distribution of these compound occurrences have been mapped and are shown on the following plates:

- Plate 1: Sample Locations
- Plate 2: Relative Response of Tetrachloroethene (PCE)
- Plate 3: Relative Response of Trichloroethene (TCE)
- Plate 4: Relative Response of Benzene, Toluene, Xylenes/Ethylbenzene (BTXE)

Example mass spectra of the compounds identified are provided as Figures 1,2 Appendix B.

Table 1 lists the reported compounds and the peaks which were summed to represent the compound occurrences reported on Plate 2.

Table 1
Reported Compounds and Their Indicator Peaks

Compound	Indicator Peaks
PCE	164
TCE	130
BTXE	78, 92, 106

The results of the GC/MS analysis of replicate wires are provided in Appendix C.

6.1 The Distribution of PCE

The distribution of PCE as detected in the soil gas is shown on Plate 2, Appendix D.

Tetrachloroethene was identified near the east survey limits. A moderate to high detection was indicated for location 24 with an adjacent moderate detection at location 23 as well as moderate detections at locations 7, 8 and 31. Lower levels were indicated for surrounding samples 8, 10, 25 and at location 15. Note that the PETREX method is extremely sensitive to PCE and the levels detected may or may not be indicative of significant soil and groundwater concentrations. The areal limits of PCE as detectable by PETREX extend beyond the survey limits to the east and northeast.

6.2 The Distribution of TCE

TCE occurrence is shown on Plate 3, Appendix D.

Trichloroethene was also identified in the east portion of the survey with a relative distribution similar to that of PCE. As such, either a coincidental source product or degradation of PCE to TCE is suggested by these results. Note that the PETREX method is much less sensitive to TCE than PCE. Thus, lower ion counts of TCE are typically more significant than equal counts of PCE. The extent of the TCE occurrence has not been determined in an east and northeast directions.

6.3 The Distribution of BTXE

BTXE compounds were detected from high to low levels in limited portions of the site. The occurrences of BTXE are shown on Plate 3, Appendix D. The highest detections occurred at locations 13 and 15 with a background level detection at location 14. Several additional low level detections occurred at locations 23, 28, 31, and 32. With the exception of the southwest corner of the survey, the identifiable areal extent of BTXE was contained within the survey boundaries.

7.0 CONCLUSIONS

The chlorinated solvents PCE and TCE as well as the petroleum hydrocarbon compounds BTXE have been detected in the soil gas. The survey results suggests that the primary potential source areas of the chlorinated solvents exists in the eastern portion of Site 74 and that BTXE source areas are present in the west central portion of the site. Dispersion appears to be limited, however PCE and TCE occurrence extends beyond the survey boundaries to the east and northeast. The lower levels of BTXE identified at the southern edge of the survey area do not necessarily represent significant levels of contamination.

8.0 RECOMMENDATIONS

Based upon the findings of the PETREX soil gas survey the following recommendations can be made:

1. Extend the PETREX soil gas survey to the east and northeast where dispersion appears to be occurring beyond the survey boundaries. This will determine the areal limits of contaminant occurrence and locate boundaries of potential source areas.

2. Perform subsurface borings and profiling of soils in areas of highest soil gas response to determine the vertical distribution of reported compounds and aid in characterizing the environmental significance of the highest soil gas response levels. If the highest soil gas response levels are identifying environmentally significant subsurface contamination, then subsurface profiling should be performed in areas of intermediate and lower soil gas response levels until plume boundaries have been identified.

9.0 GENERAL CONDITIONS

In connection with this survey and associated interpretation, only a limited scope of work was performed by NERI. NERI has maintained that both the data used to generate this report and the interpretations made within are limited in nature. Therefore, NERI maintains that it has not defined the scope of the environmental condition of this site. Professional judgements made with the context of this report are based on technical data made available to NERI as well as data gathered during onsite activities performed by Dames & Moore, Inc.

NERI assumes no responsibility for conditions which did not come to its actual knowledge or conditions not generally recognized as environmentally unacceptable at the time this report was prepared.

APPENDIX A
PETREX Protocol

PETREX ENVIRONMENTAL SOIL GAS PROTOCOL

INTRODUCTION

The Petrex Technique provides a means by which trace quantities of gases from subsurface derived organic contaminants can be detected and collected at the earth's surface. The Technique is integrative, thereby eliminating the short-term variations associated with other gas/vapor detection methods. The Petrex Technique directly collects and records a broad range of organic compounds emanating from subsurface sources.

SOIL GAS COLLECTOR PREPARATION

Adsorption collector wires (after construction) are cleaned by heating to 358°C in a high vacuum system.

Wires are packed under an inert atmosphere in glass culture tubes.

One collector out of every batch of thirty is checked for cleanliness by mass spectrometry. Another collector from the batch is checked for adsorptive capability. Based on the results, the batch of collectors is approved for release into the field.

SOIL GAS SAMPLER INSTALLATION

The sampler consists of two collectors, each a ferromagnetic wire coated with an activated carbon adsorbent in a screw top glass culture tube. Each sampler is typically placed in a shallow hole, 14-18 inches deep. The hole is backfilled and the location is marked. The sampler is left in the ground from one to thirty days, then retrieved and sealed for transportation back to the laboratory for analysis.

The Petrex soil gas sampling technique is adaptable to various surface conditions commonly encountered within survey areas. These surfaces typically include concrete, asphalt, grass, and gravel. Two installation methods are routinely utilized to adapt to these surface conditions.

The first method utilizes a coring shovel for sampler installations in grass or otherwise loosely consolidated soil conditions. The shovel cores a 14 inch deep by 2 inch diameter hole in the surface soils.

Petrex soil gas samplers are placed (open end down) at the bottom of each core hole. The samplers are then backfilled with an aluminum foil plug and the original excavated soil. To complete installation, sample locations are marked with ribbon flagging and a numbered pin flag, as well as entered into a field notebook and plotted on a field map.

The second method of sampler installation utilizes an electric rotary hammer, equipped with an 18 inch by 1.5 inch diameter drill bit, for sampler installations under concrete, asphalt, or otherwise consolidated conditions. A hole is drilled through the surface to the dimensions of the drill bit equipped to the rotary hammer.

Petrex soil gas samplers are placed at the bottom of each drilled hole. For retrieval purposes, a cleaned galvanized steel wire is attached to each sampler. Aluminum foil is used to plug each hole to approximately two inches below grade. Then each hole is capped to grade with hydraulic cement. The hydraulic cement serves as protection from the external surface environment.

To complete sampler installation, sampler locations are marked with paint (where applicable), entered into a field notebook, and plotted on a field map.

SOIL GAS SAMPLER RETRIEVAL

Petrex soil gas samplers are retrieved following a time period that has allowed for the soil gas emanating from the subsurface environment of a survey area to equilibrate with the installed Petrex samplers. This time integration period is determined for each Petrex soil gas survey based on time calibration data or site conditions.

Retrieval operations are dependent on surface conditions and routinely consist of the following two methods.

The first method applies to grass covered or loosely consolidated soil conditions. A trowel is utilized to expose the backfilled samplers; then with a pair of tongs, the samplers are brought to the surface. At the surface, the samplers are sealed, cleaned, and labeled. Following retrieval, all debris are gathered and the core hole is backfilled with original material.

The second method applies to concrete, asphalt, or other consolidated surface conditions. A hammer and chisel is utilized to remove the hydraulic cement plug and expose the sampler. By means of the pre-attached retrieval wire, the sampler is brought to the surface. At the surface, the retrieval wire is removed and the sampler is sealed, cleaned, and labeled.

Following retrieval, each drill hole is backfilled and patched with cement or asphalt.

TIME CALIBRATION SAMPLERS

Time calibration samplers are included in Petrex soil gas surveys, as appropriate. These samplers are included as a means of monitoring the loading rates of volatile and semivolatile organic compounds (VOCs and SVOCs) emanating from the soil gas at a survey area onto the Petrex collectors.

During Petrex sampler installation, two sets of three to five time calibration samplers are also installed at survey sample locations that best represent the range of soil gas response for the survey area. These representative locations are determined based on previous soils and/or groundwater studies and other site specific conditions such as gradient and potential source areas.

The first set of time calibration samplers are generally retrieved within a week or less following the initial installation and the second set one week later. Often, permanent on-site personnel are instructed by NERI to perform time calibration sampler retrieval.

Lengths of exposure periods of the survey samplers for each survey are determined based on the results of each respective set of time calibration samplers. Time calibration samplers are usually analyzed within 24 hours upon receipt at the laboratory. At the first indication of significant relative ion count intensities and significant total ion count values, the decision is made by NERI to retrieve the entire complement of survey samplers.

If there are no significant relative ion count intensities detected from the second set of time calibration samplers, then the survey samplers are allowed to equilibrate in the field for a maximum time period of up to 30 days. The average environmental Petrex soil gas survey requires a collector integration period of one day to two weeks.

METHOD QA/QC

Approximately ten percent of the total Petrex survey samplers contain three collector wires. The first collector wire, a QC collector wire, is used by the operator to test the mass spectrometer's operating conditions prior to survey analysis. Some of these quality control (QC) collectors are also used to check the mass spectrometer sensitivity during survey analysis. In addition, the QC collector may be used to compare the reproducibility of the detected VOCs. Within every survey sampler, two or more collector wires should have adsorbed identical compounds. Like compounds on separate collectors relate an acceptable quality assurance (QA) during the survey's analysis. The second wire is analyzed by Thermal Desorption/Mass Spectrometry (TD/MS). The data from the second wire is reported on the relative flux maps. The third wire is retained for analysis by Thermal Desorption-Gas Chromatography/Mass Spectrometry (TD-GC/MS), if warranted by the initial TD/MS analysis of the second wire.

TRAVEL BLANKS

Two Petrex samplers, each containing a single collector wire, are included with each Petrex soil gas survey as travel blanks. These blanks are analyzed with the survey samplers to indicate whether there may have been contamination introduced to the survey samplers during installation or shipment. If compounds other than normal atmospherics (e.g., CO_2, H_2O, N_2, and Ar) are detected on the blanks, then blank subtraction may be performed on the survey's data set. This process, an initial step to data interpretation, involves the correction of ion flux values of the detected blank contaminants from the entire survey's data set. The resulting ion flux values are provided on the relative flux maps.

MASS SPECTROMETER TUNING

An Extranuclear Quadrupole Mass Spectrometer or similar instrument, equipped with a Curie-point pyrolysis/thermal desorption inlet, is used for collector analysis. Mass assignment and resolution are manually adjusted using a Perfluorotributylamine (PFTBA) standard or a built-in tuning program, depending on the instrument. A linear correction, based on the known spectrum of PFTBA, is calculated. This correction is applied to a second PFTBA spectrum. If correct mass (M/Z) values are obtained, the operator proceeds to the next tuning step. If not, Step 1 is repeated until correct masses are obtained.

Peak intensity ratios are set from the major peaks in the PFTBA spectrum using the following values:

Mass (M/Z)		Spectrum Intensities
69	=	100%
131	=	48% ± 5%
219	=	50% ± 5%

During tuning, the ion signal for mass (M/Z) 69 of PFTBA is measured at a preset sample pressure and detector voltage and compared to previous values at the same setting.

Electron energy is set to 70 electron volts. All other operating parameters, such as scans, scan range, and mass offset, are established in the computer program. These values may only be changed by the laboratory manager.

Tuning is performed at the beginning of a run so that an individual survey is analyzed at the same set of instrument conditions. The samplers are analyzed in random order.

LABORATORY ANALYSIS

Periodic machine background and blank Petrex collector analyses are performed to assure that there is no carry-over between successive samplers. If there are peaks present which are not related to atmospheric gases, the supervisor is notified and the mass spectrometer is shut down and cleaned as necessary.

A written sample number record is kept during the analysis to prevent accidental cross numbering.

The mass spectrometer control program contains appropriate "flag statements" that prompt the operator with a warning if an input sample number has already been analyzed. The operator then checks the current number, along with the disk storage location of the previously entered number to identify the true numbering situation.

COMPOUND IDENTIFICATION

Compound identification is based on molecular weight, compound fragmentation, and isotope distribution, as applicable. Each VOC exhibits a unique mass spectral signature. NERI maintains a large library of spectra of individual compounds, accessible by computer. In addition, the company maintains a large library of mass spectra of commonly used chemical mixtures; e.g., gasolines, diesels, industrial oils and solvents, coatings, plastics, etc. These are used to assist in both compound and mixture identifications.

The ion count response of an indicator peak(s), representative of the compound and away from interference by other compounds, is extracted for data presentation and mapping.

INTERPRETATION OF SOIL GAS DATA

Soil gas data (including Petrex) reflect volatile and semivolatile organics collected at a point in the near surface. The sources of these volatile organics may be in the stratigraphic column and/or in groundwater below the collection point. Thus, the organics can be derived from surface spills, deposition, or migration into the deeper vadose zone, and groundwater. The soil gas survey reveals the areal extent of contamination and is the optimum guide in identifying areas in order to develop a vertical profile, including the drilling of soil borings and monitoring wells.

Soil gas data are always semi-quantitative in that multiple sources in soil and/or groundwater cannot be differentiated. However, the higher ion responses are representative of higher concentrations in the subsurface, given that geologic conditions are relatively consistent.

Due to chemical differences between individual compounds, including their ability to both adsorb and desorb from the charcoal Petrex collector element, it is invalid to compare the compound ion count at one sampling location to that of another compound.

Patterns of compound distribution in the soil gas, as detected at the surface, can be strongly influenced by irregularities in the near surface and subsurface environment through which the soil gas diffuses. These irregularities include subsurface man-made structures, such as concrete foundations, drainage systems, and wells, and such naturally occurring structures as fractured and unfractured bedrock, clay, and shale lenses.

Other factors influencing the soil gas signal include ground and surface water, the free carbon content of soils, microbiotic activity in the soil, and natural and synthetic ground cover.

All of these factors indicate that the most powerful use of soil gas data is in reconnaissance; identifying and mapping the relative abundance of the widest array of chemical species and mixtures. Efforts to relate soil gas response directly to groundwater or soil contaminant concentrations is generally not regarded as productive owing to the assumptions that are required for heterogeneity and source distribution.

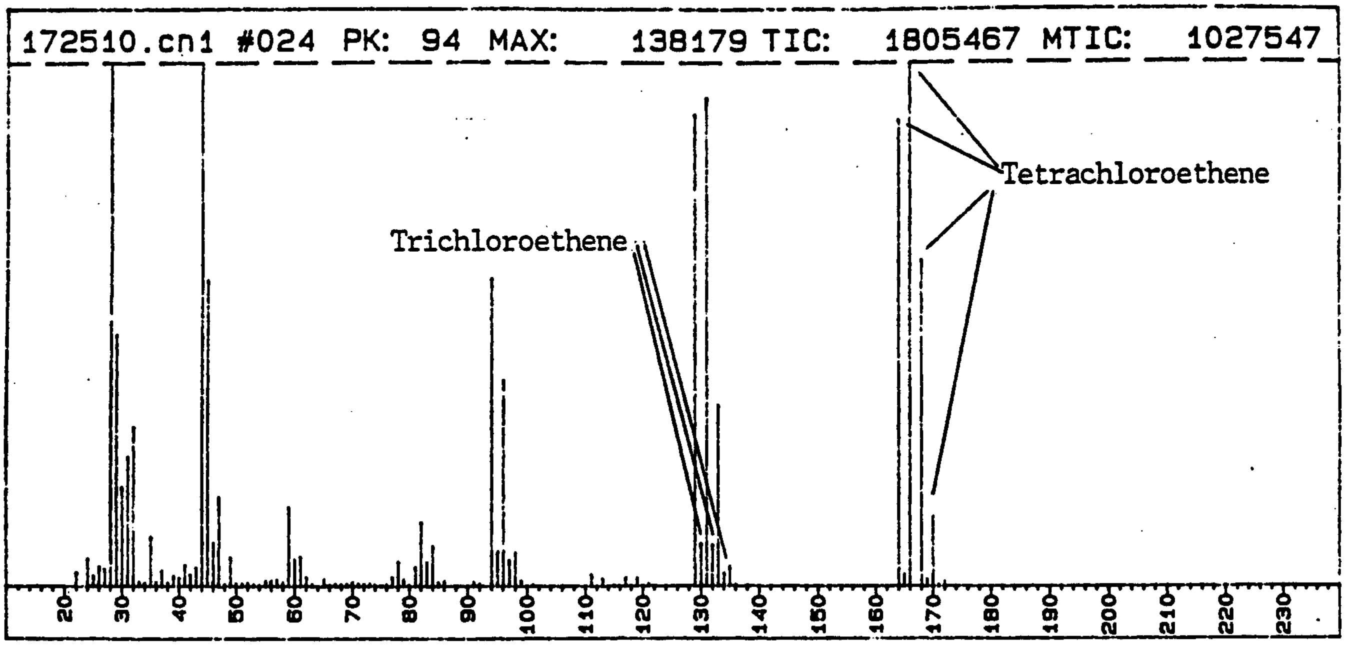
RELATIVE RESPONSE DETERMINATION AND MAPPING

The relative response values are reported as the ion counts of indicator peaks for any given compound or mixture. Sample locations on a base map are digitized as X-Y coordinates and ion counts for the reported compounds are plotted at respective locations.

Mapping of the ion counts occurs after contour intervals for each compound or component class are determined. In order to establish the contour intervals, factors such as statistical analysis of ion count distribution, physiochemical considerations, and component-source material relationships (if known) are taken into account for each compound or class, in each area, on an individual basis. Each map is then contoured by hand. The resultant contour zones for each compound or component class in each area are color coded on a relative basis depending on whether the data are interpreted to be of high, moderate to high, moderate, etc., intensity. The response values found on each of the flux maps are color coded and contoured on this basis.

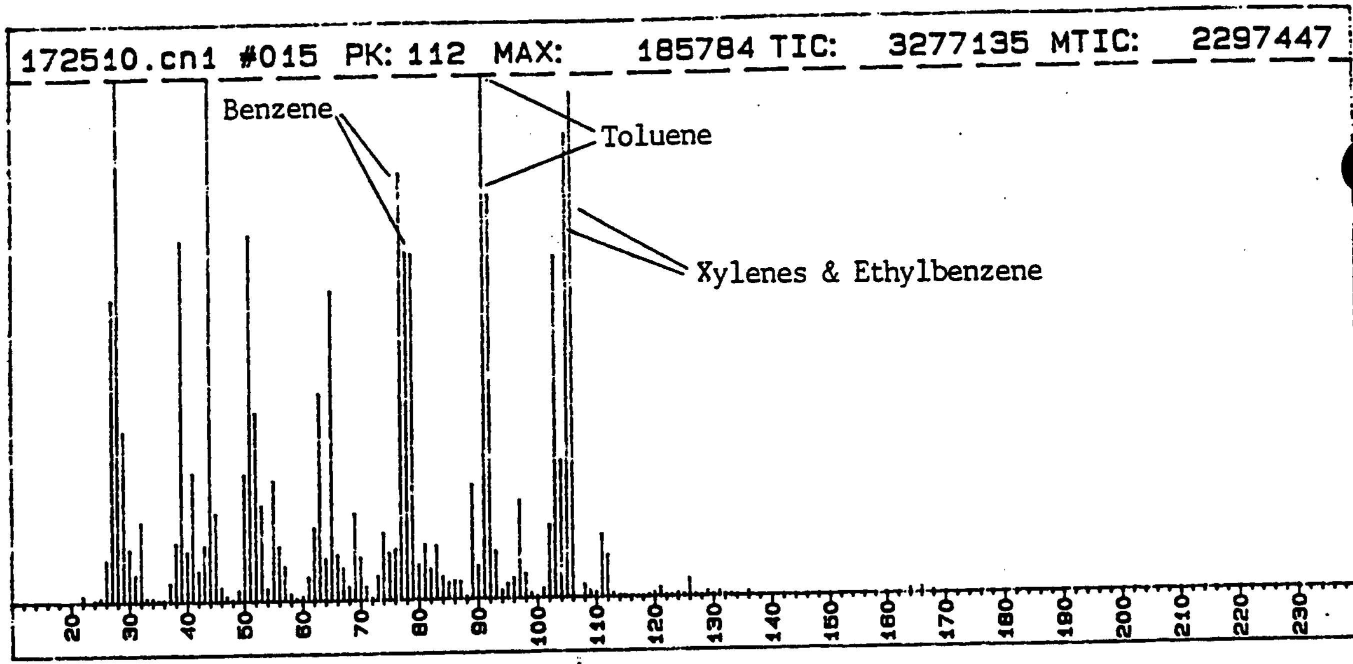
APPENDIX B
Representative Mass Spectra

Figure 1.



Mass spectral peaks associated with chlorinated comounds reported in plates 2 and 3. Sampling location 24, Umatilla Army Depot, Hermiston, Oregon.

Figure 2.



Mass spectral peaks associated with hydrocarbon compounds reported in plate 4.
Sampling location 15, Umatilla Army Depot, Hermiston, Oregon.

APPENDIX C

GC/MS Results

TABLE 1
Results of the GC/MS Analysis of the PETREX Collector

<u>Sample 7</u>

Benzene
Methylbenzene (toluene)
Tetrachloroethene

<u>Sample 14</u>

Propanone
Benzene
Diemthylbenzene

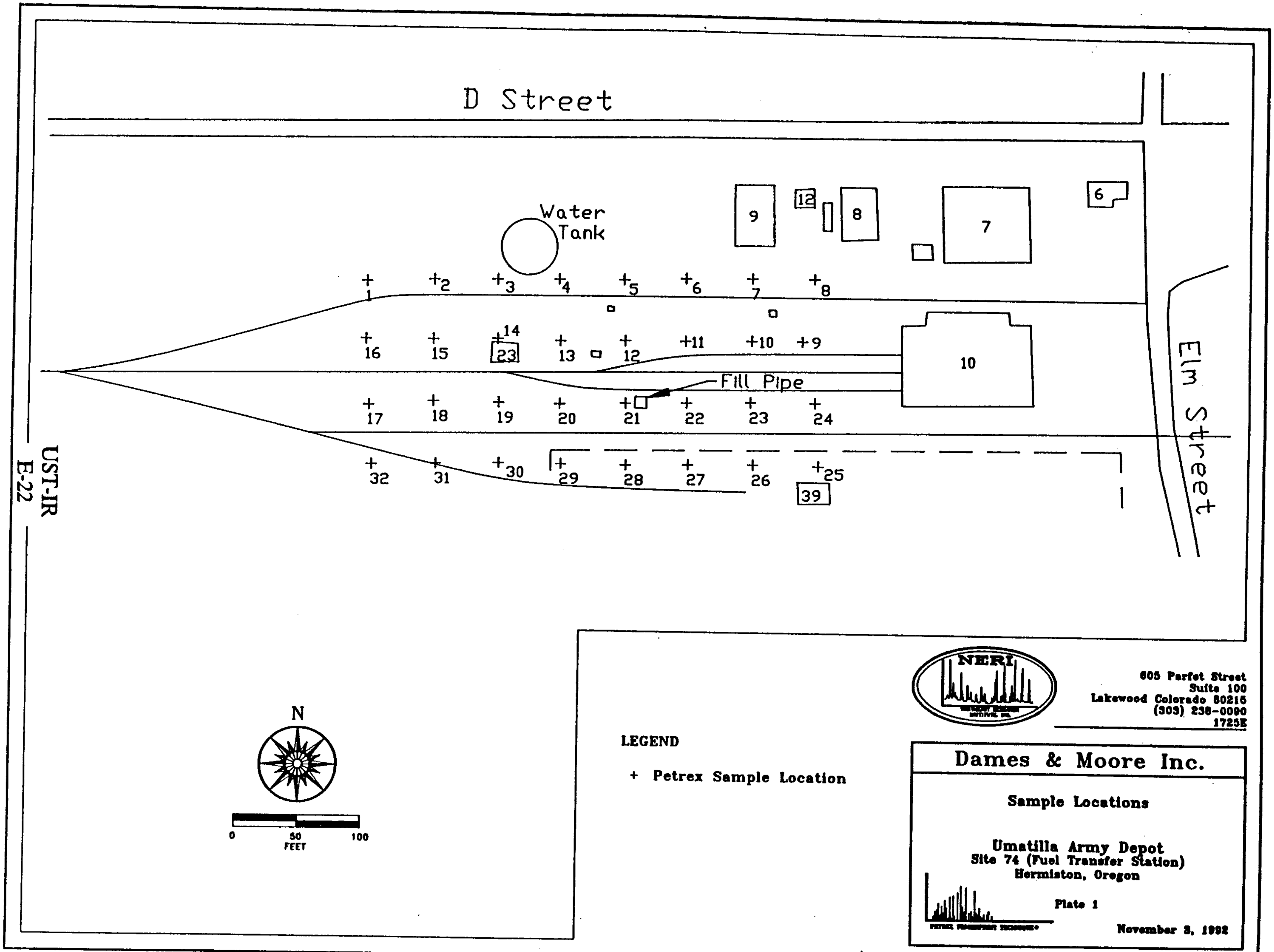
<u>Sample 25</u>

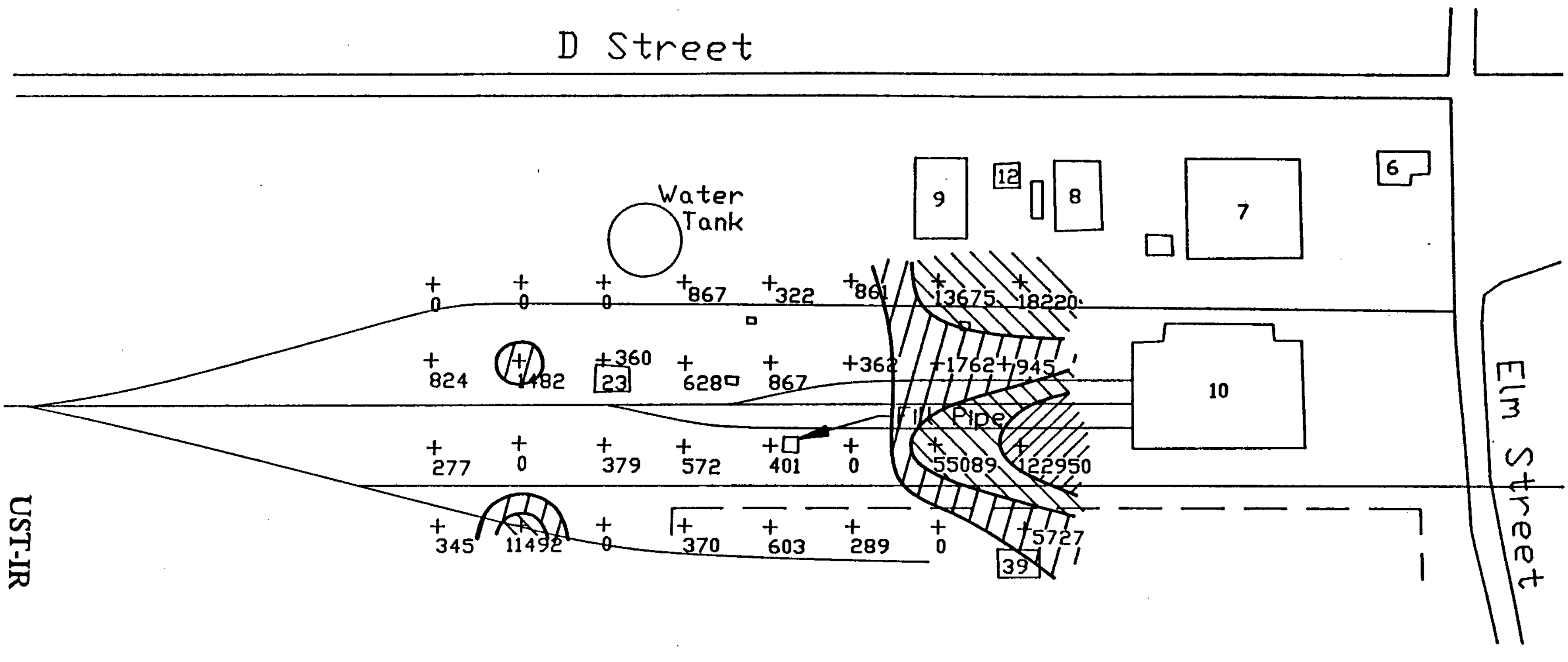
Benzene
Trichloroethene
Tetrachloroethene

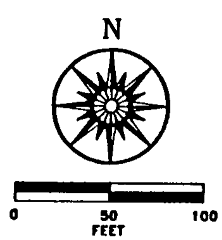
<u>Sample 31</u>

Cyclopentene
Propanone
Propylcyclopropane
Benzene
Methylbenzene
Diemthylbenzene
Ethyltrimethylcyclohexane

APPENDIX D
Plates 1-4


D Street
Elm Street
Water Tank
Fill Pipe
6
7
8
9
10
12
23
39
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
N
0
50
100
FEET
LEGEND
+ Petrex Sample Location
NERI
605 Parfet Street
Suite 100
Lakewood Colorado 80215
(303) 238-0090
1725E
Dames & Moore Inc.
Sample Locations
Umatilla Army Depot
Site 74 (Fuel Transfer Station)
Hermiston, Oregon
Plate 1
November 3, 1992





LEGEND

Relative Response Values:

- ≥ 100,000
- 10,000 – 99,999
- 900 – 9,999

\+ **Petrex Sample Location**

605 Parfet Street
Suite 100
Lakewood Colorado 80215
(303) 238-0090
1725E

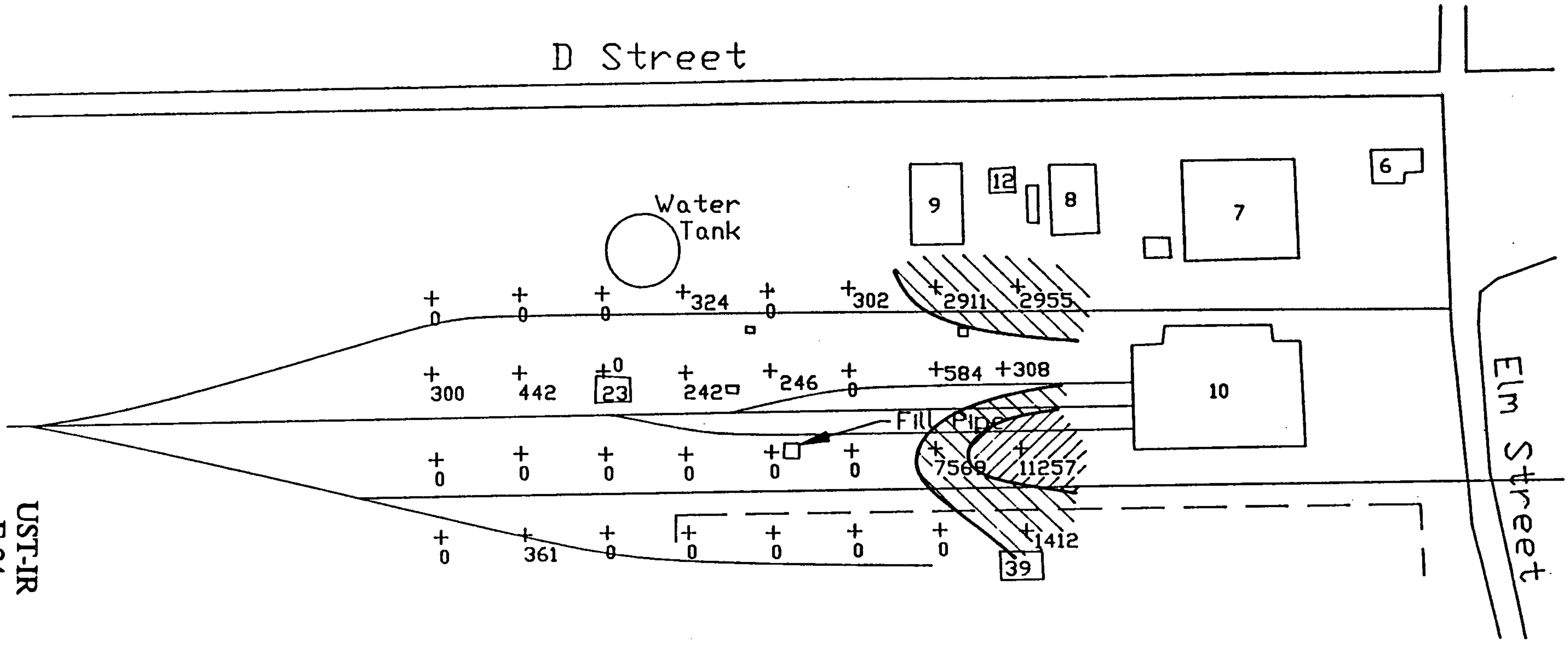
Dames & Moore Inc.

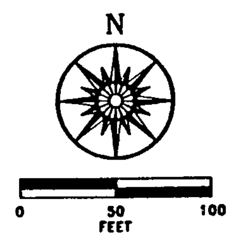
Relative Response
Tetrachloroethene (PCE)

Umatilla Army Depot
Site 74 (Fuel Transfer Station)
Hermiston, Oregon

Plate 2

November 3, 1992





LEGEND

Relative Response Values:

≥ 10,000

1,000 - 9,999

\+ Petrex Sample Location

605 Parfet Street
Suite 100
Lakewood Colorado 80215
(303) 238-0090
1725E

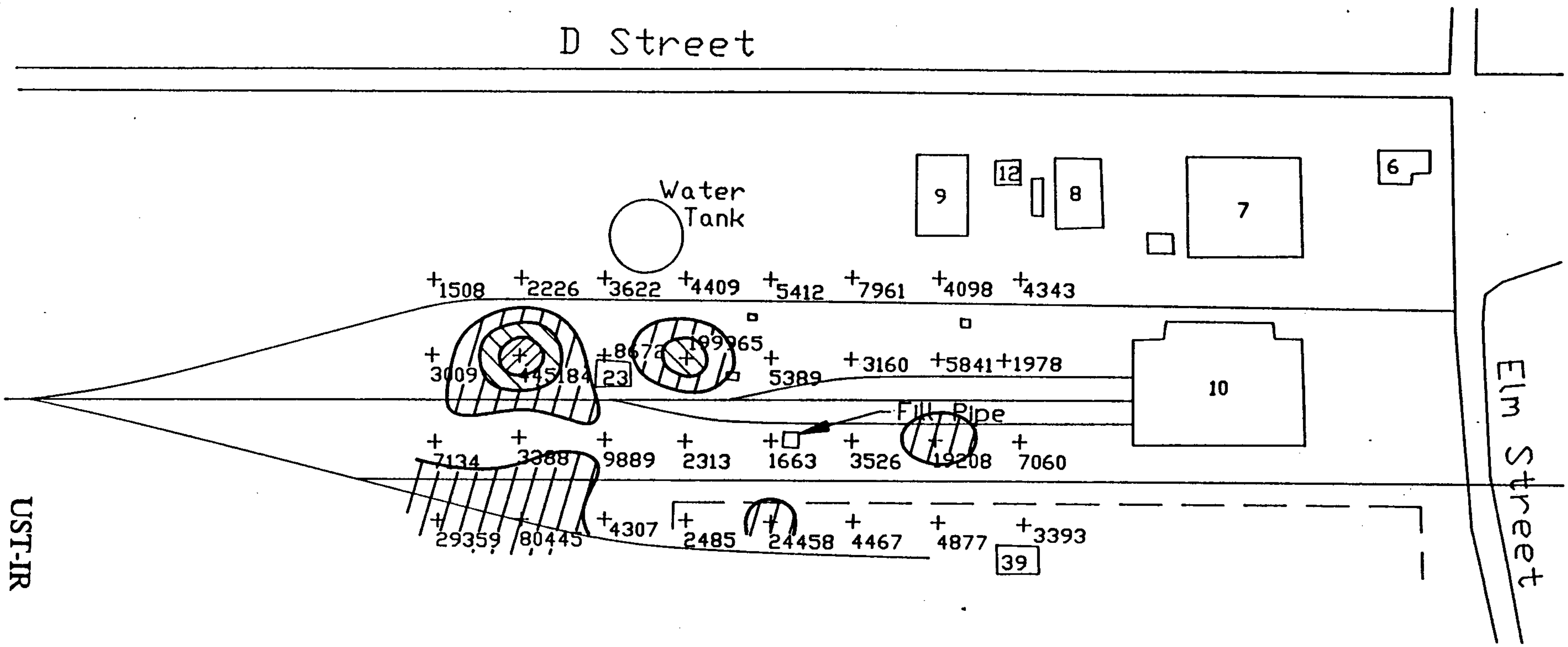
Dames & Moore Inc.

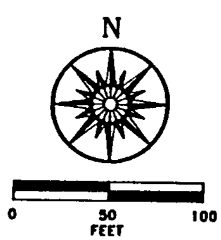
Relative Response
Trichloroethene
(TCE)

Umatilla Army Depot
Site 74 (Fuel Transfer Station)
Hermiston, Oregon

Plate 3

November 3, 1992





LEGEND

Relative Response Values:

- ≥ 400,000
- 100,000 – 399,999
- 10,000 – 99,999
- \+ Petrex Sample Location

NERI

605 Parfet Street
Suite 100
Lakewood Colorado 80215
(303) 238-0090
1725E

Dames & Moore Inc.

Relative Response
Benzene, Toluene, Ethylbenzene & Xylenes (BTEX)

Umatilla Army Depot
Site 74 (Fuel Transfer Station)
Hermiston, Oregon

Plate 4

November 3, 1992

APPENDIX F

Summary of IRDMIS Data Validation

(to be provided at a later date)

APPENDIX G

Evaluation of Laboratory and Field QC Sample Analysis Results

CONTENTS

G.1 INTRODUCTION

This appendix addresses laboratory and field QC sample analysis results. The intent is to provide a broad view of the precision and accuracy of the data presented and to assess their usability. It is not intended to be a detailed data validation report. Data validation is performed within USAEC's IRDMIS. A summary of that validation is provided in Appendix F.

The text of this appendix is divided into three principal subsections to address the evaluation of matrix effects on the data set, the precision of field duplicate sample results, and blank contamination. Each subsection contains a description of the review process employed and a narrative assessment of the data. The appendix concludes with an overall assessment of the data set based on these reviews. (Sections G.4 through G.8 provide the data sets assessed in the text.)

G.2 QUALITY CONTROL SAMPLE RESULTS

G.2.1 EVALUATION OF MATRIX EFFECTS

G.2.1.1 Methodology

The principal means of assessing matrix effects used in this evaluation was a review of surrogate recoveries for organic parameters, and matrix spike recoveries for total petroleum hydrocarbons (TPHCs).

For organics, it is assumed that the method blank and blank spike results (when present) represent an analytical condition free of matrix effects. Therefore, the average surrogate recovery for these analyses forms the center line of a control chart for a given analytical lot. A standard deviation is calculated based on all recoveries for a given surrogate in the lot. Control limits are established at 1 and 2 standard deviations (σ). The surrogate results were plotted on control charts, which are presented in Section G.4. For purposes of this assessment, values that fall between

1σ and 2σ have small biases--either positive or negative--that are not considered to be significant. Values greater than 2σ from the mean are indicative of significant biases--again, either positive or negative.

For TPHCs, matrix spike recoveries (presented in Section G.5) have been reviewed using modified EPA data validation guidelines as follows:

- % recovery = 75-125 — no significant bias
- % recovery = >125 — positive bias
- % recovery = between 30 and 75 — negative bias
- % recovery = <30 — unreliable

An exception is made when the amount of the spike is less than 25 percent of the original sample result. In that case, matrix spike criteria do not apply.

G.2.1.2 Results

G.2.1.2.1 Organics. Soil samples analyzed for VOAs displayed very good method performance. Two samples displayed a surrogate recovery of greater than 2σ from the mean. In sample UMUS 57, all three VOA surrogates recovered above 2σ. In sample UMUS 125, only 4-bromofluorobenzene exceeded the 2σ level. The surrogate percent recovery values that exceeded 2σ are all within the current EPA CLP guidelines.

In general, BNA surrogate recoveries displayed good control. However, several BNA surrogates were outside of the $\pm 2\sigma$ window. Only those BNA samples displaying two or more surrogates that exceed QC criteria or any single surrogate that recovers less than 10 percent are of concern. Four samples displayed single surrogate recoveries that did not meet the $\pm 2\sigma$ requirements, but were above 10 percent. These exceedances were disregarded as minor and having no impact on data quality. Two samples--UMUS 125 and UMUS 222--both displayed two surrogates that exceeded the 2σ criteria. In UMUS 125, both of the surrogate exceedances occurred in the acid-extractable compounds. In UMUS 222, the surrogate exceedances appeared in the acid as well as the base/neutral extractables. Although these recoveries in UMUS 125

and UMUS 222 were high, relative to the 2σ established for their respective lots, all recoveries were less than the maximum recoveries allowed for the same surrogates in the EPA CLP. Two samples--UMUS 130 and UMUS 218--displayed three surrogates that exceeded the 2σ criteria. In both samples, the surrogate recoveries that were outside 2σ spanned the range of extractable compounds. Again, all recoveries were less than the maximum percent recoveries allowed for the same surrogates in the EPA CLP.

G.2.1.2.2 TPHCs. TPHCs displayed generally good control in matrix spikes. Only sample UMUS 123 displayed matrix spike recoveries in excess of the 125 percent QC limit. The matrix spike and matrix spike duplicate TPHC recoveries for this sample were both noted at 147 percent--indicating a moderate high bias.

G.2.2 FIELD DUPLICATE ANALYSIS

G.2.2.1 Methodology

Field duplicate samples were reviewed in accordance with the Quality Assurance Project Plan (QAPP), Part C, the RI/FS Project Plan. The field duplicate analysis results are presented in Section G.6. As stated in the QAPP, soil samples are expected to agree to within ±35 percent.

G.2.2.2 Results

In general terms, the results of the field duplicate analyses are good. BNA and TPHC data display some failures for soil samples.

Three TPHC samples--UMUS 197, 187, and 125--and their duplicates displayed poor duplicate precision. In the case of duplicate UMUS 218, the imprecision was relatively minor (i.e., less than 100%) for soil samples. However, the data from duplicates UMUS 217 and 218 displayed highly variable results. Positive TPHC results for all samples associated with sample/duplicate pairs UMUS 197/217 and UMUS 187/218 should be used with caution in light of the significant degree of

variability in the quantitative data for organics, which should be considered when the data are used.

One BNA sample and its duplicate displayed inconsistencies for seven compounds. However, three of these compounds were found at notable levels in the method or rinse blanks (see Section G.2.3 below). The four remaining compounds all displayed the same inconsistency--the compounds were found in the duplicate, but were not detected in the original sample. BNA samples associated with sample/duplicate pair UMUS 84/UMUS 220 may be imprecise.

G.2.3 BLANKS

G.2.3.1 Methodology

Blank data from three sources were examined. These included laboratory method blanks, equipment rinseate blanks, and trip blanks (presented in Section G.7). The data were reviewed using the "5X and 10X rules" as follows.

The amount of a given contaminant in a blank is multiplied by five and compared to the reported value in the field samples associated with that lot. If the sample value is less than five times (5X) the blank value, the data are reported as unflagged. The same rule is applied for "typical" laboratory contaminants (i.e., acetone, methylene chloride, methyl ethyl ketone, toluene, and various phthalate esters), except that the blank concentration is multiplied by 10. This procedure has been employed, and the data tables have been updated with regard to trip blank and method blank data. Rinseate blank results are addressed in more detail below.

G.2.3.2 Results

No contamination of trip blanks was found.

Rinseate blanks displayed routine contamination with chloroform, as well as sporadic contamination with 2-ethylhexanol, dioctyl adipate, and three unknown compounds. Of these, 2-ethylhexanol was identified at a level equal to or above the EPA contract required detection limit.

Soil method blanks displayed contamination for trichlorofluoromethane, di-n-butyl phthalate, and dioctyl adipate. None of the soil method blank contaminants met or exceeded the EPA contract required detection limit.

Overall, blank results demonstrated acceptable performance, indicating good control of potential cross contamination in the field and laboratory. However, positive results for 2-ethylhexanol should be used with caution, considering the positive results found in the blanks above the EPA contract required detection limit.

G.3 CONCLUSION

The overall data quality for this field effort is very good. Precision, accuracy, and representativeness are sufficiently high for the data set to be used with confidence in decision making. There are, however, a few notable exceptions.

- BNA field duplicate UMUS 217 displayed significant variability. The results in samples associated with the duplicate should be used with caution.
- TPHC field duplicate results generally displayed a significant level of imprecision, which may affect the usability of the TPHC data.

G.4

Organic Surrogate Control Charts

ORGANIC SURROGATE CONTROL CHARTS

VOC Surrogate Results - Soil
1,2-Dichloroethane-D4

	12DCD4	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		118.10	106.05	94.00	81.95	69.90
UMUS 45	98.2			•		
UMUS 50	96.6			•		
UMUS 204	93.1			•		
UMUS 205	76.7				•	
UMUS 206	75.1				•	
UMUS 207	95.6			•		
UMUS 208	95.3			•		
UMUS 209	77.3				•	
UMUS 211	95.8			•		
UMUS 212	100.1			•		
UMUS 213	95.9			•		
UMUS 214	96.9			•		
UMUS 215	93			•		
UMUS 216	96.5			•		
UMUS 217	95.3			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		118.10	106.05	94.00	81.95	69.90
UMUS 152	92.4			•		
UMUS 153	91.9			•		
UMUS 155	97.7			•		
UMUS 156	87.6			•		
UMUS 157	100			•		
UMUS 158	106			•		
UMUS 160	96.1			•		
UMUS 161	102.5			•		
UMUS 163	105.8			•		
UMUS 164	107.2		•			
UMUS 165	104.8			•		
UMUS 166	98.1			•		
UMUS 203	109		•			

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		118.10	106.05	94.00	81.95	69.90
UMUS 120	94.3			•		
UMUS 121	75.2				•	
UMUS 122	92.8			•		
UMUS 130	77.6				•	
UMUS 131	92.6			•		
UMUS 210	84.6			•		

VOC Surrogate Results - Soil
1,2-Dichloroethane-D4

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		118.10	106.05	94.00	81.95	69.90
UMUS 35	104.1			•		
UMUS 101	109		•			
UMUS 108	112.6		•			
UMUS 119	96.3			•		
UMUS 132	105.2			•		
UMUS 133	104			•		
UMUS 134	107.4		•			
UMUS 200	88.1			•		
UMUS 201	102.7			•		
UMUS 218	102.7			•		
UMUS 219	105.9			•		
UMUS 220	100.8			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		114.10	102.05	90.00	77.95	65.90
UMUS 162	94.1			•		
UMUS 187	90.9			•		
UMUS 188	86.3			•		
UMUS 189	95.8			•		
UMUS 190	100			•		
UMUS 192	99.5			•		
UMUS 193	93.3			•		
UMUS 194	98			•		
UMUS 195	94			•		
UMUS 197	97.1			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		112.10	100.05	88.00	75.95	63.90
UMUS 57	16.5					•
UMUS 52	104.6		•			
UMUS 62	94			•		
UMUS 67	107.4		•			
UMUS 69	109.5		•			
UMUS 79	103.6		•			
UMUS 86	106.8		•			
UMUS 118	108.1		•			
UMUS 202	100			•		

VOC Surrogate Results - Soil
1,2-Dichloroethane-D4

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		128.10	116.05	104.00	91.95	79.90
UMUS 1	108.9			•		
UMUS 11	97.7			•		
UMUS 40	101.2			•		
UMUS 74	95.2			•		
UMUS 84	101.3			•		
UMUS 91	99.5			•		
UMUS 96	99.1			•		
UMUS 103	99.8			•		
UMUS 113	105.2			•		
UMUS 135	98.7			•		
UMUS 140	98.6			•		
UMUS 145	100.7			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		126.10	114.05	102.00	89.95	77.90
UMUS 198	95.9			•		
UMUS 199	101.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		126.10	114.05	102.00	89.95	77.90
UMUS 6	112.7			•		
UMUS 16	112.4			•		
UMUS 123	117.7		•			
UMUS 124	100.7			•		
UMUS 150	94.9			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		114.10	102.05	90.00	77.95	65.90
UMUS 125	104.8		•			
UMUS 126	85.9			•		
UMUS 221	95.6			•		

VOC Surrogate Results - Soil
Toluene-D8

	MEC6D8	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		124.37	112.18	100.00	87.82	75.63
UMUS 45	102.2			•		
UMUS 50	102.2			•		
UMUS 204	101.8			•		
UMUS 205	102.1			•		
UMUS 206	100.5			•		
UMUS 207	102.3			•		
UMUS 208	100.4			•		
UMUS 209	99.7			•		
UMUS 211	101.5			•		
UMUS 212	115.3		•			
UMUS 213	98.4			•		
UMUS 214	101.4			•		
UMUS 215	98.6			•		
UMUS 216	97.5			•		
UMUS 217	98.8			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		124.37	112.18	100.00	87.82	75.63
UMUS 152	101.2			•		
UMUS 153	100.1			•		
UMUS 155	103.8			•		
UMUS 156	95.3			•		
UMUS 157	109.6			•		
UMUS 158	114.3		•			
UMUS 160	101.9			•		
UMUS 161	110			•		
UMUS 163	104			•		
UMUS 164	114.6		•			
UMUS 165	112.5		•			
UMUS 166	105			•		
UMUS 203	118.9		•			

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		122.37	110.18	98.00	85.82	73.63
UMUS 120	95.9			•		
UMUS 121	95.7			•		
UMUS 122	96			•		
UMUS 130	101.3			•		
UMUS 131	96.1			•		
UMUS 210	101.2			•		

VOC Surrogate Results - Soil
Toluene-D8

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		126.37	114.18	102.00	89.82	77.63
UMUS 35	108.2			•		
UMUS 101	123.6		•			
UMUS 108	110.8			•		
UMUS 119	92.4			•		
UMUS 132	115.2		•			
UMUS 133	116.8		•			
UMUS 134	110			•		
UMUS 200	100.9			•		
UMUS 201	110.5			•		
UMUS 218	100.8			•		
UMUS 219	101.3			•		
UMUS 220	108.4			•		

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		126.37	114.18	102.00	89.82	77.63
UMUS 162	104.2			•		
UMUS 187	101.1			•		
UMUS 188	99.3			•		
UMUS 189	109.5			•		
UMUS 190	116.1		•			
UMUS 192	115.7		•			
UMUS 193	115.7		•			
UMUS 194	108.2			•		
UMUS 195	108.6			•		
UMUS 197	114.9		•			

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		122.37	110.18	98.00	85.82	73.63
UMUS 57	16.7					•
UMUS 52	106.5			•		
UMUS 62	100			•		
UMUS 67	115.5		•			
UMUS 69	114.6		•			
UMUS 79	110.3		•			
UMUS 86	116		•			
UMUS 118	114.6		•			
UMUS 202	104			•		

VOC Surrogate Results - Soil
Toluene-D8

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		124.37	112.18	100.00	87.82	75.63
UMUS 1	108.4			•		
UMUS 11	97.1			•		
UMUS 40	101.1			•		
UMUS 74	94.5			•		
UMUS 84	100			•		
UMUS 91	98			•		
UMUS 96	98.6			•		
UMUS 103	97.1			•		
UMUS 113	105.6			•		
UMUS 135	96.3			•		
UMUS 140	96.5			•		
UMUS 145	98.3			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		132.37	120.18	108.00	95.82	83.63
UMUS 198	100			•		
UMUS 199	106.4			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		132.37	120.18	108.00	95.82	83.63
UMUS 6	118.6			•		
UMUS 16	118.6			•		
UMUS 123	114.7			•		
UMUS 124	105.1			•		
UMUS 150	106.7			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		128.37	116.18	104.00	91.82	79.63
UMUS 125	131.4	•				
UMUS 126	96.9			•		
UMUS 221	105.2			•		

VOC Surrogate Results - Soil
4-Bromofluorobenzene

	4BFB	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		115.66	106.83	98.00	89.17	80.34
UMUS 45	95.9			•		
UMUS 50	97.2			•		
UMUS 204	96.5			•		
UMUS 205	97			•		
UMUS 206	95.2			•		
UMUS 207	98.1			•		
UMUS 208	99.2			•		
UMUS 209	96			•		
UMUS 211	101.2			•		
UMUS 212	91.8			•		
UMUS 213	97.2			•		
UMUS 214	97.6			•		
UMUS 215	96			•		
UMUS 216	100.6			•		
UMUS 217	104.4			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		125.66	116.83	108.00	99.17	90.34
UMUS 152	105.7			•		
UMUS 153	108.9			•		
UMUS 155	103.6			•		
UMUS 156	109.6			•		
UMUS 157	105.1			•		
UMUS 158	114			•		
UMUS 160	104.4			•		
UMUS 161	110.7			•		
UMUS 163	113.8			•		
UMUS 164	104.6			•		
UMUS 165	101.4			•		
UMUS 166	108.4			•		
UMUS 203	103.2			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		119.66	110.83	102.00	93.17	84.34
UMUS 120	99.1			•		
UMUS 121	102.6			•		
UMUS 122	98.2			•		
UMUS 130	95.8			•		
UMUS 131	96.3			•		
UMUS 210	100.7			•		

VOC Surrogate Results - Soil
4-Bromofluorobenzene

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		113.66	104.83	96.00	87.17	78.34
UMUS 35	99.8			•		
UMUS 101	97.9			•		
UMUS 108	101.1			•		
UMUS 119	108.8		•			
UMUS 132	102.1			•		
UMUS 133	101.3			•		
UMUS 134	104.6			•		
UMUS 200	92			•		
UMUS 201	96.7			•		
UMUS 218	108		•			
UMUS 219	110.7		•			
UMUS 220	91.1			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		119.66	110.83	102.00	93.17	84.34
UMUS 162	99.8			•		
UMUS 187	96.1			•		
UMUS 188	98.7			•		
UMUS 189	102			•		
UMUS 190	111		•			
UMUS 192	102.7			•		
UMUS 193	98.8			•		
UMUS 194	101.6			•		
UMUS 195	101			•		
UMUS 197	96.8			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		115.66	106.83	98.00	89.17	80.34
UMUS 57	39.5					•
UMUS 52	99			•		
UMUS 62	103.8			•		
UMUS 67	99			•		
UMUS 69	103.2			•		
UMUS 79	100.7			•		
UMUS 86	97.7			•		
UMUS 118	92.6			•		
UMUS 202	102.1			•		

VOC Surrogate Results - Soil
4-Bromofluorobenzene

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		115.66	106.83	98.00	89.17	80.34
UMUS 1	98			•		
UMUS 11	88.9				•	
UMUS 40	93.9			•		
UMUS 74	89.7			•		
UMUS 84	93.3			•		
UMUS 91	94.3			•		
UMUS 96	93			•		
UMUS 103	88.6				•	
UMUS 113	98.4			•		
UMUS 135	91.2			•		
UMUS 140	92.5			•		
UMUS 145	91.9			•		

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		121.66	112.83	104.00	95.17	86.34
UMUS 198	100.8			•		
UMUS 199	102.1			•		

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		113.66	104.83	96.00	87.17	78.34
UMUS 6	106.1		•			
UMUS 16	107.4		•			
UMUS 123	90.9			•		
UMUS 124	112.4		•			
UMUS 150	98.7			•		

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		123.66	114.83	106.00	97.17	88.34
UMUS 125	87.7					•
UMUS 126	109			•		
UMUS 221	106.9			•		

BNA Surrogate Results - Soil
2-Fluorophenol

Sample	2FP	< +2 Std Dev 110.16	< +1 Std Dev 94.63	Average 79.10	-1 Std Dev > 63.58	-2 Std Dev > 48.05
UMUS 156	75.9			•		
UMUS 155	76.2			•		
UMUS 166	77.2			•		
UMUS 153	83.4			•		
UMUS 164	75.4			•		
UMUS 152	77.1			•		
UMUS 162	81.9			•		
UMUS 208	79.9			•		
UMUS 160	78.1			•		
UMUS 202	79.8			•		
UMUS 157	78.9			•		
UMUS 203	73.8			•		
UMUS 165	67.6			•		
UMUS 204	78.4			•		
UMUS 161	75.6			•		
UMUS 205	78.0			•		
UMUS 207	70.5			•		
UMUS 158	73.0			•		
UMUS 163	70.5			•		
UMUS 206	74.7			•		

Sample		< +2 Std Dev 98.22	< +1 Std Dev 82.69	Average 67.16	-1 Std Dev > 51.64	-2 Std Dev > 36.11
UMUS 69	67.3			•		
UMUS 130	52.5			•		
UMUS 118	57.1			•		
UMUS 122	67.6			•		
UMUS 67	65.7			•		
UMUS 45	72.6			•		
UMUS 62	74.2			•		
UMUS 119	65.4			•		
UMUS 57	57.1			•		
UMUS 79	73.5			•		
UMUS 52	60.0			•		
UMUS 86	67.5			•		
UMUS 121	64.5			•		
UMUS 120	70.6			•		
UMUS 50	76.6			•		

BNA Surrogate Results - Soil
2-Fluorophenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		80.31	64.78	49.25	33.73	18.20
UMUS 189	47.2			•		
UMUS 198	48.1			•		
UMUS 187	42.0			•		
UMUS 190	49.3			•		
UMUS 197	55.3			•		
UMUS 132	53.2			•		
UMUS 195	51.0			•		
UMUS 134	47.1			•		
UMUS 194	49.2			•		
UMUS 188	56.7			•		
UMUS 193	40.3			•		
UMUS 133	46.8			•		
UMUS 131	57.6			•		
UMUS 199	52.2			•		
UMUS 192	50.7			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		74.34	58.81	43.28	27.76	12.23
UMUS 108	49.9			•		
UMUS 220	44.1			•		
UMUS 84	46.5			•		
UMUS 101	48.1			•		
UMUS 74	41.4			•		
UMUS 219	43.3			•		
UMUS 40	44.4			•		
UMUS 91	48.9			•		
UMUS 201	43.8			•		
UMUS 200	48.3			•		
UMUS 35	46.9			•		
UMUS 96	47.5			•		
UMUS 218	69.1		•			

BNA Surrogate Results - Soil
2-Fluorophenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		116.13	100.60	85.07	69.55	54.02
UMUS 211	90.9			•		
UMUS 217	87.4			•		
UMUS 214	87.7			•		
UMUS 210	83.8			•		
UMUS 213	88.3			•		
UMUS 215	84.3			•		
UMUS 216	90.6			•		
UMUS 209	85.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		126.58	111.05	95.52	79.99	64.47
UMUS 6	84.9			•		
UMUS 11	88.5			•		
UMUS 103	72.9				•	
UMUS 145	92.2			•		
UMUS 16	82.0			•		
UMUS 135	86.7			•		
UMUS 140	84.1			•		
UMUS 113	86.4			•		
UMUS 1	87.4			•		
UMUS 150	88.8			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		104.19	88.66	73.13	57.61	42.08
UMUS 221	77.4			•		
UMUS 123	79.9			•		
UMUS 124	69.7			•		
UMUS 125	39.7					•
UMUS 126	73.0			•		
UMUS 222	56.5				•	

BNA Surrogate Results - Soil
Phenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		107.89	94.24	80.60	66.95	53.31
UMUS 156	68.7			•		
UMUS 155	72.9			•		
UMUS 166	79			•		
UMUS 153	84.1			•		
UMUS 164	71.5			•		
UMUS 152	72.9			•		
UMUS 162	79.3			•		
UMUS 208	76.6			•		
UMUS 160	70.5			•		
UMUS 202	74.4			•		
UMUS 157	71.4			•		
UMUS 203	69.7			•		
UMUS 165	68.5			•		
UMUS 204	73.9			•		
UMUS 161	71.1			•		
UMUS 205	75.9			•		
UMUS 207	60.1				•	
UMUS 158	70			•		
UMUS 163	67.5			•		
UMUS 206	71.2			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		97.44	83.79	70.15	56.50	42.86
UMUS 69	68.1			•		
UMUS 130	43				•	
UMUS 118	50.4				•	
UMUS 122	69.9			•		
UMUS 67	66.6			•		
UMUS 45	65.7			•		
UMUS 62	70.2			•		
UMUS 119	67.6			•		
UMUS 57	59.1			•		
UMUS 79	70.2			•		
UMUS 52	58.3			•		
UMUS 86	67.6			•		
UMUS 121	59.2			•		
UMUS 120	70.5			•		
UMUS 50	75.7			•		

BNA Surrogate Results - Soil
Phenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		79.53	65.88	52.24	38.59	24.95
UMUS 189	50.5			•		
UMUS 198	51			•		
UMUS 187	44.4			•		
UMUS 190	49.8			•		
UMUS 197	55.9			•		
UMUS 132	53.2			•		
UMUS 195	52.8			•		
UMUS 134	50.2			•		
UMUS 194	51			•		
UMUS 188	55.9			•		
UMUS 193	41.4			•		
UMUS 133	46.2			•		
UMUS 131	58.3			•		
UMUS 199	53.1			•		
UMUS 192	54			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		75.05	61.41	47.76	34.12	20.47
UMUS 108	51.7			•		
UMUS 220	45.4			•		
UMUS 84	49.6			•		
UMUS 101	50.4			•		
UMUS 74	43.9			•		
UMUS 219	45.4			•		
UMUS 40	47.8			•		
UMUS 91	49.9			•		
UMUS 201	46.8			•		
UMUS 200	49.5			•		
UMUS 35	50.4			•		
UMUS 96	51.6			•		
UMUS 218	72.3		•			

BNA Surrogate Results - Soil
Phenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		106.39	92.75	79.10	65.46	51.81
UMUS 211	84.4			•		
UMUS 217	83.5			•		
UMUS 214	83.5			•		
UMUS 210	76.9			•		
UMUS 213	82.2			•		
UMUS 215	79			•		
UMUS 216	85.2			•		
UMUS 209	79.2			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		118.33	104.69	91.04	77.40	63.75
UMUS 6	83.5			•		
UMUS 11	87.3			•		
UMUS 103	70.8				•	
UMUS 145	89.4			•		
UMUS 16	82.6			•		
UMUS 135	85.9			•		
UMUS 140	81.9			•		
UMUS 113	83.5			•		
UMUS 1	85			•		
UMUS 150	86.2			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		100.42	86.78	73.13	59.49	45.84
UMUS 221	75.7			•		
UMUS 123	75.4			•		
UMUS 124	72			•		
UMUS 125	40.8					•
UMUS 126	74.8			•		
UMUS 222	55				•	

BNA Surrogate Results - Soil
Nitrobenzene-D5

	NBD5	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		103.78	86.74	69.70	52.66	35.62
UMUS 156	68.2			•		
UMUS 155	73.3			•		
UMUS 166	67.6			•		
UMUS 153	82.3			•		
UMUS 164	64.9			•		
UMUS 152	71.5			•		
UMUS 162	67.9			•		
UMUS 208	72.1			•		
UMUS 160	67.3			•		
UMUS 202	67			•		
UMUS 157	67.6			•		
UMUS 203	64			•		
UMUS 165	60.7			•		
UMUS 204	72.4			•		
UMUS 161	72.1			•		
UMUS 205	65.2			•		
UMUS 207	56.8			•		
UMUS 158	77.5			•		
UMUS 163	61			•		
UMUS 206	70.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		109.84	92.80	75.76	58.72	41.68
UMUS 69	85.9			•		
UMUS 130	36.6					•
UMUS 118	45.9				•	
UMUS 122	81.7			•		
UMUS 67	83.2			•		
UMUS 45	73.9			•		
UMUS 62	88			•		
UMUS 119	83.5			•		
UMUS 57	97		•			
UMUS 79	80.8			•		
UMUS 52	62.2			•		
UMUS 86	67.9			•		
UMUS 121	72.4			•		
UMUS 120	78.7			•		
UMUS 50	71.8			•		

BNA Surrogate Results - Soil
Nitrobenzene-D5

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		88.63	71.59	54.55	37.51	20.47
UMUS 189	45.3			•		
UMUS 198	52.9			•		
UMUS 187	42			•		
UMUS 190	50.5			•		
UMUS 197	50.2			•		
UMUS 132	48.6			•		
UMUS 195	49.8			•		
UMUS 134	48.6			•		
UMUS 194	50.2			•		
UMUS 188	48.9			•		
UMUS 193	44.4			•		
UMUS 133	48.9			•		
UMUS 131	61.3			•		
UMUS 199	54.7			•		
UMUS 192	58.3			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		79.53	62.49	45.45	28.41	11.37
UMUS 108	47.1			•		
UMUS 220	42.3			•		
UMUS 84	48.9			•		
UMUS 101	43.5			•		
UMUS 74	45			•		
UMUS 219	51.4			•		
UMUS 40	51.4			•		
UMUS 91	47.4			•		
UMUS 201	48.6			•		
UMUS 200	47.7			•		
UMUS 35	48.9			•		
UMUS 96	50.5			•		
UMUS 218	70		•			

BNA Surrogate Results - Soil
Nitrobenzene-D5

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		112.87	95.83	78.79	61.75	44.71
UMUS 211	81.7			•		
UMUS 217	83.2			•		
UMUS 214	82.6			•		
UMUS 210	74.8			•		
UMUS 213	76.6			•		
UMUS 215	75.7			•		
UMUS 216	83.5			•		
UMUS 209	78.1			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		140.14	123.10	106.06	89.02	71.98
UMUS 6	97.6			•		
UMUS 11	98.2			•		
UMUS 103	76				•	
UMUS 145	103.6			•		
UMUS 16	98.2			•		
UMUS 135	95.5			•		
UMUS 140	92.5			•		
UMUS 113	95.2			•		
UMUS 1	95.5			•		
UMUS 150	99.1			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		128.02	110.98	93.94	76.90	59.86
UMUS 221	83.8			•		
UMUS 123	88.3			•		
UMUS 124	85.9			•		
UMUS 125	66.4				•	
UMUS 126	81.7			•		
UMUS 222	51.4					•

BNA Surrogate Results - Soil
2-Fluorobiphenyl

	2FBP	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		83.43	73.53	63.64	53.74	43.84
UMUS 156	69.1			•		
UMUS 155	70.3			•		
UMUS 166	77.8		•			
UMUS 153	71.2			•		
UMUS 164	66.7			•		
UMUS 152	72.7			•		
UMUS 162	81.1		•			
UMUS 208	70.9			•		
UMUS 160	70			•		
UMUS 202	70.9			•		
UMUS 157	73.9		•			
UMUS 203	68.2			•		
UMUS 165	63.4			•		
UMUS 204	70.6			•		
UMUS 161	69.7			•		
UMUS 205	65.5			•		
UMUS 207	64.6			•		
UMUS 158	67.9			•		
UMUS 163	70.9			•		
UMUS 206	70.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		95.55	85.66	75.76	65.86	55.96
UMUS 69	71.5			•		
UMUS 130	58.6				•	
UMUS 118	64.6				•	
UMUS 122	77.2			•		
UMUS 67	74.5			•		
UMUS 45	79.3			•		
UMUS 62	75.7			•		
UMUS 119	80.2			•		
UMUS 57	64.3				•	
UMUS 79	77.5			•		
UMUS 52	65.8				•	
UMUS 86	75.1			•		
UMUS 121	76			•		
UMUS 120	76.3			•		
UMUS 50	81.7			•		

BNA Surrogate Results - Soil
2-Fluorobiphenyl

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		83.43	73.53	63.64	53.74	43.84
UMUS 189	56.2			•		
UMUS 198	62.8			•		
UMUS 187	59.8			•		
UMUS 190	59.8			•		
UMUS 197	65.2			•		
UMUS 132	66.4			•		
UMUS 195	69.1			•		
UMUS 134	64.9			•		
UMUS 194	61.9			•		
UMUS 188	69.1			•		
UMUS 193	53.2				•	
UMUS 133	63.4			•		
UMUS 131	71.8			•		
UMUS 199	61.6			•		
UMUS 192	67.3			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		77.37	67.47	57.58	47.68	37.78
UMUS 108	62.5			•		
UMUS 220	61			•		
UMUS 84	57.1			•		
UMUS 101	55.9			•		
UMUS 74	47.1				•	
UMUS 219	59.5			•		
UMUS 40	56.8			•		
UMUS 91	60.1			•		
UMUS 201	52.6			•		
UMUS 200	58.3			•		
UMUS 35	56.8			•		
UMUS 96	54.1			•		
UMUS 218	87.4	•				

BNA Surrogate Results - Soil
2-Fluorobiphenyl

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		92.52	82.62	72.73	62.83	52.93
UMUS 211	79			•		
UMUS 217	78.1			•		
UMUS 214	79.9			•		
UMUS 210	73.6			•		
UMUS 213	80.2			•		
UMUS 215	73.6			•		
UMUS 216	81.1			•		
UMUS 209	76			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		101.61	91.72	81.82	71.92	62.02
UMUS 6	77.8			•		
UMUS 11	76.9			•		
UMUS 103	70				•	
UMUS 145	84.4			•		
UMUS 16	79.3			•		
UMUS 135	82.3			•		
UMUS 140	73			•		
UMUS 113	85.3			•		
UMUS 1	81.1			•		
UMUS 150	85			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		101.61	91.72	81.82	71.92	62.02
UMUS 221	88.9			•		
UMUS 123	94.9		•			
UMUS 124	87.4			•		
UMUS 125	74.8			•		
UMUS 126	96.1		•			
UMUS 222	85.6			•		

BNA Surrogate Results - Soil
2,4,6-Tribromophenol

	246TBP	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		79.82	68.27	56.72	45.17	33.61
UMUS 156	66.6			•		
UMUS 155	63.7			•		
UMUS 166	69.1		•			
UMUS 153	69.1		•			
UMUS 164	57.7			•		
UMUS 152	65.2			•		
UMUS 162	64.9			•		
UMUS 208	61.9			•		
UMUS 160	58.9			•		
UMUS 202	68.1			•		
UMUS 157	63.7			•		
UMUS 203	66.1			•		
UMUS 165	58.2			•		
UMUS 204	70		•			
UMUS 161	62.2			•		
UMUS 205	62.1			•		
UMUS 207	33.3					•
UMUS 158	55.3			•		
UMUS 163	55.9			•		
UMUS 206	67.3			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		82.80	71.25	59.70	48.15	36.60
UMUS 69	61.9			•		
UMUS 130	22.2					•
UMUS 118	22.6					•
UMUS 122	62.4			•		
UMUS 67	58.2			•		
UMUS 45	70.8			•		
UMUS 62	63.1			•		
UMUS 119	80.2		•			
UMUS 57	67.2			•		
UMUS 79	57			•		
UMUS 52	42.9				•	
UMUS 86	62.1			•		
UMUS 121	78.1		•			
UMUS 120	58.9			•		
UMUS 50	67.9			•		

BNA Surrogate Results - Soil
2,4,6-Tribromophenol

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		75.34	63.79	52.24	40.69	29.14
UMUS 189	49.5			•		
UMUS 198	52			•		
UMUS 187	27.1					•
UMUS 190	52.5			•		
UMUS 197	52.6			•		
UMUS 132	54			•		
UMUS 195	55.2			•		
UMUS 134	52.6			•		
UMUS 194	50.8			•		
UMUS 188	53.8			•		
UMUS 193	43.9			•		
UMUS 133	45.4			•		
UMUS 131	54.9			•		
UMUS 199	52.3			•		
UMUS 192	59.1			•		

Sample	Result	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		73.85	62.30	50.75	39.20	27.64
UMUS 108	45.9			•		
UMUS 220	48.9			•		
UMUS 84	46.6			•		
UMUS 101	45.6			•		
UMUS 74	40.8			•		
UMUS 219	48.6			•		
UMUS 40	47.4			•		
UMUS 91	45.7			•		
UMUS 201	43.5			•		
UMUS 200	49.2			•		
UMUS 35	46			•		
UMUS 96	45.1			•		
UMUS 218	76.5	•				

BNA Surrogate Results - Soil
2,4,6-Tribromophenol

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		82.80	71.25	59.70	48.15	36.60
UMUS 211	72.1		•			
UMUS 217	66.3			•		
UMUS 214	65.7			•		
UMUS 210	55.2			•		
UMUS 213	67			•		
UMUS 215	60			•		
UMUS 216	64.9			•		
UMUS 209	64.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		82.80	71.25	59.70	48.15	36.60
UMUS 6	58.5			•		
UMUS 11	58.6			•		
UMUS 103	58.5			•		
UMUS 145	65.2			•		
UMUS 16	57.6			•		
UMUS 135	55.5			•		
UMUS 140	48.7			•		
UMUS 113	69.7			•		
UMUS 1	61.3			•		
UMUS 150	69.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		88.77	77.22	65.67	54.12	42.57
UMUS 221	46.2				•	
UMUS 123	53.7				•	
UMUS 124	65.5			•		
UMUS 125	42.7				•	
UMUS 126	72.3			•		
UMUS 222	30					•

BNA Surrogate Results - Soil
Terphenyl-D14

	TERPD14	< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		121.83	106.37	90.91	75.45	59.99
UMUS 156	88.6			•		
UMUS 155	94.6			•		
UMUS 166	100.9			•		
UMUS 153	97.9			•		
UMUS 164	97.3			•		
UMUS 152	86.8			•		
UMUS 162	96.1			•		
UMUS 208	99.4			•		
UMUS 160	101.5			•		
UMUS 202	96.1			•		
UMUS 157	87.4			•		
UMUS 203	98.8			•		
UMUS 165	96.4			•		
UMUS 204	92.2			•		
UMUS 161	91.3			•		
UMUS 205	86.5			•		
UMUS 207	79.6			•		
UMUS 158	82.9			•		
UMUS 163	95.2			•		
UMUS 206	94			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		133.95	118.49	103.03	87.57	72.11
UMUS 69	97.9			•		
UMUS 130	64.3					•
UMUS 118	73.6				•	
UMUS 122	101.5			•		
UMUS 67	95.2			•		
UMUS 45	89.2			•		
UMUS 62	87.4				•	
UMUS 119	82.3				•	
UMUS 57	72.7				•	
UMUS 79	92.5			•		
UMUS 52	78.7				•	
UMUS 86	87.7			•		
UMUS 121	100.6			•		
UMUS 120	95.2			•		
UMUS 50	100.9			•		

BNA Surrogate Results - Soil
Terphenyl-D14

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		94.56	79.10	63.64	48.18	32.72
UMUS 189	61.9			•		
UMUS 198	61.9			•		
UMUS 187	51.7			•		
UMUS 190	58			•		
UMUS 197	71.8			•		
UMUS 132	65.8			•		
UMUS 195	60.4			•		
UMUS 134	62.2			•		
UMUS 194	61.9			•		
UMUS 188	61.3			•		
UMUS 193	48				•	
UMUS 133	65.5			•		
UMUS 131	72.1			•		
UMUS 199	67.3			•		
UMUS 192	63.7			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		97.59	82.13	66.67	51.21	35.75
UMUS 108	73.6			•		
UMUS 220	65.5			•		
UMUS 84	68.2			•		
UMUS 101	65.8			•		
UMUS 74	63.1			•		
UMUS 219	64			•		
UMUS 40	65.8			•		
UMUS 91	66.1			•		
UMUS 201	64.9			•		
UMUS 200	67.3			•		
UMUS 35	65.5			•		
UMUS 96	73.6			•		
UMUS 218	104.8	•				

BNA Surrogate Results - Soil
Terphenyl-D14

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		85.47	70.01	54.55	39.09	23.63
UMUS 211	72.4		•			
UMUS 217	60.7			•		
UMUS 214	60.1			•		
UMUS 210	58.9			•		
UMUS 213	63.4			•		
UMUS 215	61.6			•		
UMUS 216	61			•		
UMUS 209	59.8			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		103.65	88.19	72.73	57.27	41.81
UMUS 6	69.4			•		
UMUS 11	64.6			•		
UMUS 103	65.8			•		
UMUS 145	71.2			•		
UMUS 16	68.2			•		
UMUS 135	61.6			•		
UMUS 140	30.3					•
UMUS 113	77.5			•		
UMUS 1	69.7			•		
UMUS 150	73.6			•		

		< +2 Std Dev	< +1 Std Dev	Average	-1 Std Dev >	-2 Std Dev >
		112.74	97.28	81.82	66.36	50.90
UMUS 221	89.2			•		
UMUS 123	85.9			•		
UMUS 124	79			•		
UMUS 125	64.9				•	
UMUS 126	84.7			•		
UMUS 222	72.7			•		

G.5

Matrix Spike Recovery Data--TPH

MATRIX SPIKE RECOVERY DATA – TPH

SITE ID	MAT	FIELD ID	CORR MEAS	UNIT	M SPIKE	PER RC
STAA016	N	UMUS*67	1200.000	UGG	1220.000	98.360
STAA016	N	UMUS*67	1230.000	UGG	1220.000	100.800
S73A002	N	UMUS*192	1110.000	UGG	1230.000	90.240
S73A002	N	UMUS*192	1130.000	UGG	1230.000	91.870
S74A002	N	UMUS*208	1160.000	UGG	1200.000	96.670
S74A002	N	UMUS*208	1160.000	UGG	1200.000	96.670
STAA036	N	UMUS*156	1140.000	UGG	1160.000	98.280
STAA036	N	UMUS*156	1140.000	UGG	1160.000	98.280
STAA001	N	UMUS*1	1260.000	UGG	1250.000	100.800
STAA001	N	UMUS*1	1260.000	UGG	1250.000	100.800
STAA029	N	UMUS*123	1730.000	UGG	1170.000	147.900
STAA029	N	UMUS*123	1730.000	UGG	1170.000	147.900

G.6

Field Duplicate Analysis Results

FIELD DUPLICATE ANALYSIS RESULTS

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A001	UMUS*187	TPHC		804.000	100.000
S73A001D	UMUS*218	TPHC	LT	28.700	100.000
S73A003	UMUS*197	TPHC	LT	28.700	100.000
S73A003D	UMUS*219	TPHC	LT	28.700	100.000
S74A003	UMUS*212	TPHC		1540.000	100.000
S74A003D	UMUS*217	TPHC	LT	28.800	100.000
STAA020	UMUS*84	TPHC	LT	28.500	100.000
STAA020D	UMUS*220	TPHC	LT	28.800	100.000
STAA030	UMUS*125	TPHC		911.000	100.000
STAA030D	UMUS*221	TPHC		1660.000	100.000
S73A001	UMUS*187	124TCB	LT	0.400	0.040
S73A001D	UMUS*218	124TCB	LT	0.040	0.040
S73A003	UMUS*197	124TCB	LT	0.040	0.040
S73A003D	UMUS*219	124TCB	LT	0.040	0.040
S74A003D	UMUS*217	124TCB	LT	0.040	0.040
STAA020	UMUS*84	124TCB	LT	0.040	0.040
STAA020D	UMUS*220	124TCB	LT	0.040	0.040
STAA030	UMUS*125	124TCB	LT	0.400	0.040
STAA030D	UMUS*221	124TCB	LT	0.400	0.040
S73A001	UMUS*187	12DCLB	LT	1.000	0.110
S73A001D	UMUS*218	12DCLB	LT	0.110	0.110
S73A003	UMUS*197	12DCLB	LT	0.110	0.110
S73A003D	UMUS*219	12DCLB	LT	0.110	0.110
S74A003D	UMUS*217	12DCLB	LT	0.110	0.110
STAA020	UMUS*84	12DCLB	LT	0.110	0.110
STAA020D	UMUS*220	12DCLB	LT	0.110	0.110
STAA030	UMUS*125	12DCLB	LT	1.000	0.110
STAA030D	UMUS*221	12DCLB	LT	1.000	0.110
S73A001	UMUS*187	12DPH	ND	1.000	0.000
S73A001D	UMUS*218	12DPH	ND	0.140	0.000
S73A003	UMUS*197	12DPH	ND	0.140	0.000
S73A003D	UMUS*219	12DPH	ND	0.140	0.000
S74A003D	UMUS*217	12DPH	ND	0.140	0.000
STAA020	UMUS*84	12DPH	ND	0.140	0.000
STAA020D	UMUS*220	12DPH	ND	0.140	0.000
STAA030	UMUS*125	12DPH	ND	1.000	0.000
STAA030D	UMUS*221	12DPH	ND	1.000	0.000
S73A001	UMUS*187	13DCLB	LT	1.000	0.130
S73A001D	UMUS*218	13DCLB	LT	0.130	0.130
S73A003	UMUS*197	13DCLB	LT	0.130	0.130
S73A003D	UMUS*219	13DCLB	LT	0.130	0.130
S74A003D	UMUS*217	13DCLB	LT	0.130	0.130
STAA020	UMUS*84	13DCLB	LT	0.130	0.130
STAA020D	UMUS*220	13DCLB	LT	0.130	0.130
STAA030	UMUS*125	13DCLB	LT	1.000	0.130
STAA030D	UMUS*221	13DCLB	LT	1.000	0.130
S73A001	UMUS*187	14DCLB	LT	1.000	0.098
S73A001D	UMUS*218	14DCLB	LT	0.098	0.098

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A003	UMUS*197	14DCLB	LT	0.098	0.098
S73A003D	UMUS*219	14DCLB	LT	0.098	0.098
S74A003D	UMUS*217	14DCLB	LT	0.098	0.098
STAA020	UMUS*84	14DCLB	LT	0.098	0.098
STAA020D	UMUS*220	14DCLB	LT	0.098	0.098
STAA030	UMUS*125	14DCLB	LT	1.000	0.098
STAA030D	UMUS*221	14DCLB	LT	1.000	0.098
S73A001	UMUS*187	245TCP	LT	1.000	0.100
S73A001D	UMUS*218	245TCP	LT	0.100	0.100
S73A003	UMUS*197	245TCP	LT	0.100	0.100
S73A003D	UMUS*219	245TCP	LT	0.100	0.100
S74A003D	UMUS*217	245TCP	LT	0.100	0.100
STAA020	UMUS*84	245TCP	LT	0.100	0.100
STAA020D	UMUS*220	245TCP	LT	0.100	0.100
STAA030	UMUS*125	245TCP	LT	1.000	0.100
STAA030D	UMUS*221	245TCP	LT	1.000	0.100
S73A001	UMUS*187	246TCP	LT	2.000	0.170
S73A001D	UMUS*218	246TCP	LT	0.170	0.170
S73A003	UMUS*197	246TCP	LT	0.170	0.170
S73A003D	UMUS*219	246TCP	LT	0.170	0.170
S74A003D	UMUS*217	246TCP	LT	0.170	0.170
STAA020	UMUS*84	246TCP	LT	0.170	0.170
STAA020D	UMUS*220	246TCP	LT	0.170	0.170
STAA030	UMUS*125	246TCP	LT	2.000	0.170
STAA030D	UMUS*221	246TCP	LT	2.000	0.170
S73A001	UMUS*187	24DCLP	LT	2.000	0.180
S73A001D	UMUS*218	24DCLP	LT	0.180	0.180
S73A003	UMUS*197	24DCLP	LT	0.180	0.180
S73A003D	UMUS*219	24DCLP	LT	0.180	0.180
S74A003D	UMUS*217	24DCLP	LT	0.180	0.180
STAA020	UMUS*84	24DCLP	LT	0.180	0.180
STAA020D	UMUS*220	24DCLP	LT	0.180	0.180
STAA030	UMUS*125	24DCLP	LT	2.000	0.180
STAA030D	UMUS*221	24DCLP	LT	2.000	0.180
S73A001	UMUS*187	24DMPN	LT	7.000	0.690
S73A001D	UMUS*218	24DMPN	LT	0.690	0.690
S73A003	UMUS*197	24DMPN	LT	0.690	0.690
S73A003D	UMUS*219	24DMPN	LT	0.690	0.690
S74A003D	UMUS*217	24DMPN	LT	0.690	0.690
STAA020	UMUS*84	24DMPN	LT	0.690	0.690
STAA020D	UMUS*220	24DMPN	LT	0.690	0.690
STAA030	UMUS*125	24DMPN	LT	7.000	0.690
STAA030D	UMUS*221	24DMPN	LT	7.000	0.690
S73A001	UMUS*187	24DNP	LT	10.000	1.200
S73A001D	UMUS*218	24DNP	LT	1.200	1.200
S73A003	UMUS*197	24DNP	LT	1.200	1.200
S73A003D	UMUS*219	24DNP	LT	1.200	1.200
S74A003D	UMUS*217	24DNP	LT	1.200	1.200
STAA020	UMUS*84	24DNP	LT	1.200	1.200
STAA020D	UMUS*220	24DNP	LT	1.200	1.200
STAA030	UMUS*125	24DNP	LT	10.000	1.200
STAA030D	UMUS*221	24DNP	LT	10.000	1.200

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A001	UMUS*187	24DNT	LT	1.000	0.140
S73A001D	UMUS*218	24DNT	LT	0.140	0.140
S73A003	UMUS*197	24DNT	LT	0.140	0.140
S73A003D	UMUS*219	24DNT	LT	0.140	0.140
S74A003D	UMUS*217	24DNT	LT	0.140	0.140
STAA020	UMUS*84	24DNT	LT	0.140	0.140
STAA020D	UMUS*220	24DNT	LT	0.140	0.140
STAA030	UMUS*125	24DNT	LT	1.000	0.140
STAA030D	UMUS*221	24DNT	LT	1.000	0.140
S73A001	UMUS*187	26DNT	LT	0.800	0.085
S73A001D	UMUS*218	26DNT	LT	0.085	0.085
S73A003	UMUS*197	26DNT	LT	0.085	0.085
S73A003D	UMUS*219	26DNT	LT	0.085	0.085
S74A003D	UMUS*217	26DNT	LT	0.085	0.085
STAA020	UMUS*84	26DNT	LT	0.085	0.085
STAA020D	UMUS*220	26DNT	LT	0.085	0.085
STAA030	UMUS*125	26DNT	LT	0.800	0.085
STAA030D	UMUS*221	26DNT	LT	0.800	0.085
S73A001	UMUS*187	2CLP	LT	0.600	0.060
S73A001D	UMUS*218	2CLP	LT	0.060	0.060
S73A003	UMUS*197	2CLP	LT	0.060	0.060
S73A003D	UMUS*219	2CLP	LT	0.060	0.060
S74A003D	UMUS*217	2CLP	LT	0.060	0.060
STAA020	UMUS*84	2CLP	LT	0.060	0.060
STAA020D	UMUS*220	2CLP	LT	0.060	0.060
STAA030	UMUS*125	2CLP	LT	0.600	0.060
STAA030D	UMUS*221	2CLP	LT	0.600	0.060
S73A001	UMUS*187	2CNAP	LT	0.400	0.036
S73A001D	UMUS*218	2CNAP	LT	0.036	0.036
S73A003	UMUS*197	2CNAP	LT	0.036	0.036
S73A003D	UMUS*219	2CNAP	LT	0.036	0.036
S74A003D	UMUS*217	2CNAP	LT	0.036	0.036
STAA020	UMUS*84	2CNAP	LT	0.036	0.036
STAA020D	UMUS*220	2CNAP	LT	0.036	0.036
STAA030	UMUS*125	2CNAP	LT	0.400	0.036
STAA030D	UMUS*221	2CNAP	LT	0.400	0.036
S73A001	UMUS*187	2MNAP	LT	0.500	0.049
S73A001D	UMUS*218	2MNAP	LT	0.049	0.049
S73A003	UMUS*197	2MNAP	LT	0.049	0.049
S73A003D	UMUS*219	2MNAP	LT	0.049	0.049
S74A003D	UMUS*217	2MNAP	LT	0.049	0.049
STAA020	UMUS*84	2MNAP	LT	0.049	0.049
STAA020D	UMUS*220	2MNAP	LT	0.049	0.049
STAA030	UMUS*125	2MNAP	LT	0.500	0.049
STAA030D	UMUS*221	2MNAP	LT	0.500	0.049
S73A001	UMUS*187	2MP	LT	0.300	0.029
S73A001D	UMUS*218	2MP	LT	0.029	0.029
S73A003	UMUS*197	2MP	LT	0.029	0.029
S73A003D	UMUS*219	2MP	LT	0.029	0.029
S74A003D	UMUS*217	2MP	LT	0.029	0.029
STAA020	UMUS*84	2MP	LT	0.029	0.029
STAA020D	UMUS*220	2MP	LT	0.029	0.029

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA030	UMUS*125	2MP	LT	0.300	0.029
STAA030D	UMUS*221	2MP	LT	0.300	0.029
S73A001	UMUS*187	2NANIL	LT	0.600	0.062
S73A001D	UMUS*218	2NANIL	LT	0.062	0.062
S73A003	UMUS*197	2NANIL	LT	0.062	0.062
S73A003D	UMUS*219	2NANIL	LT	0.062	0.062
S74A003D	UMUS*217	2NANIL	LT	0.062	0.062
STAA020	UMUS*84	2NANIL	LT	0.062	0.062
STAA020D	UMUS*220	2NANIL	LT	0.062	0.062
STAA030	UMUS*125	2NANIL	LT	0.600	0.062
STAA030D	UMUS*221	2NANIL	LT	0.600	0.062
S73A001	UMUS*187	2NP	LT	1.000	0.140
S73A001D	UMUS*218	2NP	LT	0.140	0.140
S73A003	UMUS*197	2NP	LT	0.140	0.140
S73A003D	UMUS*219	2NP	LT	0.140	0.140
S74A003D	UMUS*217	2NP	LT	0.140	0.140
STAA020	UMUS*84	2NP	LT	0.140	0.140
STAA020D	UMUS*220	2NP	LT	0.140	0.140
STAA030	UMUS*125	2NP	LT	1.000	0.140
STAA030D	UMUS*221	2NP	LT	1.000	0.140
S73A001	UMUS*187	33DCBD	LT	60.000	6.300
S73A001D	UMUS*218	33DCBD	LT	6.300	6.300
S73A003	UMUS*197	33DCBD	LT	6.300	6.300
S73A003D	UMUS*219	33DCBD	LT	6.300	6.300
S74A003D	UMUS*217	33DCBD	LT	6.300	6.300
STAA020	UMUS*84	33DCBD	LT	6.300	6.300
STAA020D	UMUS*220	33DCBD	LT	6.300	6.300
STAA030	UMUS*125	33DCBD	LT	60.000	6.300
STAA030D	UMUS*221	33DCBD	LT	60.000	6.300
S73A001	UMUS*187	3NANIL	LT	4.000	0.450
S73A001D	UMUS*218	3NANIL	LT	0.450	0.450
S73A003	UMUS*197	3NANIL	LT	0.450	0.450
S73A003D	UMUS*219	3NANIL	LT	0.450	0.450
S74A003D	UMUS*217	3NANIL	LT	0.450	0.450
STAA020	UMUS*84	3NANIL	LT	0.450	0.450
STAA020D	UMUS*220	3NANIL	LT	0.450	0.450
STAA030	UMUS*125	3NANIL	LT	4.000	0.450
STAA030D	UMUS*221	3NANIL	LT	4.000	0.450
S73A001	UMUS*187	46DN2C	LT	6.000	0.550
S73A001D	UMUS*218	46DN2C	LT	0.550	0.550
S73A003	UMUS*197	46DN2C	LT	0.550	0.550
S73A003D	UMUS*219	46DN2C	LT	0.550	0.550
S74A003D	UMUS*217	46DN2C	LT	0.550	0.550
STAA020	UMUS*84	46DN2C	LT	0.550	0.550
STAA020D	UMUS*220	46DN2C	LT	0.550	0.550
STAA030	UMUS*125	46DN2C	LT	6.000	0.550
STAA030D	UMUS*221	46DN2C	LT	6.000	0.550
S73A001	UMUS*187	4BRPPE	LT	0.300	0.033
S73A001D	UMUS*218	4BRPPE	LT	0.033	0.033
S73A003	UMUS*197	4BRPPE	LT	0.033	0.033
S73A003D	UMUS*219	4BRPPE	LT	0.033	0.033
S74A003D	UMUS*217	4BRPPE	LT	0.033	0.033

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA020	UMUS*84	4BRPPE	LT	0.033	0.033
STAA020D	UMUS*220	4BRPPE	LT	0.033	0.033
STAA030	UMUS*125	4BRPPE	LT	0.300	0.033
STAA030D	UMUS*221	4BRPPE	LT	0.300	0.033
S73A001	UMUS*187	4CANIL	LT	8.000	0.810
S73A001D	UMUS*218	4CANIL	LT	0.810	0.810
S73A003	UMUS*197	4CANIL	LT	0.810	0.810
S73A003D	UMUS*219	4CANIL	LT	0.810	0.810
S74A003D	UMUS*217	4CANIL	LT	0.810	0.810
STAA020	UMUS*84	4CANIL	LT	0.810	0.810
STAA020D	UMUS*220	4CANIL	LT	0.810	0.810
STAA030	UMUS*125	4CANIL	LT	8.000	0.810
STAA030D	UMUS*221	4CANIL	LT	8.000	0.810
S73A001	UMUS*187	4CL3C	LT	1.000	0.095
S73A001D	UMUS*218	4CL3C	LT	0.095	0.095
S73A003	UMUS*197	4CL3C	LT	0.095	0.095
S73A003D	UMUS*219	4CL3C	LT	0.095	0.095
S74A003D	UMUS*217	4CL3C	LT	0.095	0.095
STAA020	UMUS*84	4CL3C	LT	0.095	0.095
STAA020D	UMUS*220	4CL3C	LT	0.095	0.095
STAA030	UMUS*125	4CL3C	LT	1.000	0.095
STAA030D	UMUS*221	4CL3C	LT	1.000	0.095
S73A001	UMUS*187	4CLPPE	LT	0.300	0.033
S73A001D	UMUS*218	4CLPPE	LT	0.033	0.033
S73A003	UMUS*197	4CLPPE	LT	0.033	0.033
S73A003D	UMUS*219	4CLPPE	LT	0.033	0.033
S74A003D	UMUS*217	4CLPPE	LT	0.033	0.033
STAA020	UMUS*84	4CLPPE	LT	0.033	0.033
STAA020D	UMUS*220	4CLPPE	LT	0.033	0.033
STAA030	UMUS*125	4CLPPE	LT	0.300	0.033
STAA030D	UMUS*221	4CLPPE	LT	0.300	0.033
S73A001	UMUS*187	4MP	LT	2.000	0.240
S73A001D	UMUS*218	4MP	LT	0.240	0.240
S73A003	UMUS*197	4MP	LT	0.240	0.240
S73A003D	UMUS*219	4MP	LT	0.240	0.240
S74A003D	UMUS*217	4MP	LT	0.240	0.240
STAA020	UMUS*84	4MP	LT	0.240	0.240
STAA020D	UMUS*220	4MP	LT	0.240	0.240
STAA030	UMUS*125	4MP	LT	2.000	0.240
STAA030D	UMUS*221	4MP	LT	2.000	0.240
S73A001	UMUS*187	4NANIL	LT	4.000	0.410
S73A001D	UMUS*218	4NANIL	LT	0.410	0.410
S73A003	UMUS*197	4NANIL	LT	0.410	0.410
S73A003D	UMUS*219	4NANIL	LT	0.410	0.410
S74A003D	UMUS*217	4NANIL	LT	0.410	0.410
STAA020	UMUS*84	4NANIL	LT	0.410	0.410
STAA020D	UMUS*220	4NANIL	LT	0.410	0.410
STAA030	UMUS*125	4NANIL	LT	4.000	0.410
STAA030D	UMUS*221	4NANIL	LT	4.000	0.410
S73A001	UMUS*187	4NP	LT	10.000	1.400
S73A001D	UMUS*218	4NP	LT	1.400	1.400
S73A003	UMUS*197	4NP	LT	1.400	1.400
S73A003D	UMUS*219	4NP	LT	1.400	1.400

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003D	UMUS*217	4NP	LT	1.400	1.400
STAA020	UMUS*84	4NP	LT	1.400	1.400
STAA020D	UMUS*220	4NP	LT	1.400	1.400
STAA030	UMUS*125	4NP	LT	10.000	1.400
STAA030D	UMUS*221	4NP	LT	10.000	1.400
S73A001	UMUS*187	ABHC	ND	3.000	0.270
S73A001D	UMUS*218	ABHC	ND	0.270	0.270
S73A003	UMUS*197	ABHC	ND	0.270	0.270
S73A003D	UMUS*219	ABHC	ND	0.270	0.270
S74A003D	UMUS*217	ABHC	ND	0.270	0.270
STAA020	UMUS*84	ABHC	ND	0.270	0.270
STAA020D	UMUS*220	ABHC	ND	0.270	0.270
STAA030	UMUS*125	ABHC	ND	3.000	0.270
STAA030D	UMUS*221	ABHC	ND	3.000	0.270
S73A001	UMUS*187	ACLDAN	ND	3.000	0.330
S73A001D	UMUS*218	ACLDAN	ND	0.330	0.330
S73A003	UMUS*197	ACLDAN	ND	0.330	0.330
S73A003D	UMUS*219	ACLDAN	ND	0.330	0.330
S74A003D	UMUS*217	ACLDAN	ND	0.330	0.330
STAA020	UMUS*84	ACLDAN	ND	0.330	0.330
STAA020D	UMUS*220	ACLDAN	ND	0.330	0.330
STAA030	UMUS*125	ACLDAN	ND	3.000	0.330
STAA030D	UMUS*221	ACLDAN	ND	3.000	0.330
S73A001	UMUS*187	AENSLF	ND	6.000	0.620
S73A001D	UMUS*218	AENSLF	ND	0.620	0.620
S73A003	UMUS*197	AENSLF	ND	0.620	0.620
S73A003D	UMUS*219	AENSLF	ND	0.620	0.620
S74A003D	UMUS*217	AENSLF	ND	0.620	0.620
STAA020	UMUS*84	AENSLF	ND	0.620	0.620
STAA020D	UMUS*220	AENSLF	ND	0.620	0.620
STAA030	UMUS*125	AENSLF	ND	6.000	0.620
STAA030D	UMUS*221	AENSLF	ND	6.000	0.620
S73A001	UMUS*187	ALDRN	ND	3.000	0.330
S73A001D	UMUS*218	ALDRN	ND	0.330	0.330
S73A003	UMUS*197	ALDRN	ND	0.330	0.330
S73A003D	UMUS*219	ALDRN	ND	0.330	0.330
S74A003D	UMUS*217	ALDRN	ND	0.330	0.330
STAA020	UMUS*84	ALDRN	ND	0.330	0.330
STAA020D	UMUS*220	ALDRN	ND	0.330	0.330
STAA030	UMUS*125	ALDRN	ND	3.000	0.330
STAA030D	UMUS*221	ALDRN	ND	3.000	0.330
S73A001	UMUS*187	ANAPNE	LT	0.400	0.036
S73A001D	UMUS*218	ANAPNE	LT	0.036	0.036
S73A003	UMUS*197	ANAPNE	LT	0.036	0.036
S73A003D	UMUS*219	ANAPNE	LT	0.036	0.036
S74A003D	UMUS*217	ANAPNE	LT	0.036	0.036
STAA020	UMUS*84	ANAPNE	LT	0.036	0.036
STAA020D	UMUS*220	ANAPNE	LT	0.036	0.036
STAA030	UMUS*125	ANAPNE	LT	0.400	0.036
STAA030D	UMUS*221	ANAPNE	LT	0.400	0.036
S73A001	UMUS*187	ANAPYL	LT	0.300	0.033
S73A001D	UMUS*218	ANAPYL	LT	0.033	0.033

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A003	UMUS*197	ANAPYL	LT	0.033	0.033
S73A003D	UMUS*219	ANAPYL	LT	0.033	0.033
S74A003D	UMUS*217	ANAPYL	LT	0.033	0.033
STAA020	UMUS*84	ANAPYL	LT	0.033	0.033
STAA020D	UMUS*220	ANAPYL	LT	0.033	0.033
STAA030	UMUS*125	ANAPYL	LT	0.300	0.033
STAA030D	UMUS*221	ANAPYL	LT	0.300	0.033
S73A001	UMUS*187	ANTRC	LT	0.300	0.033
S73A001D	UMUS*218	ANTRC	LT	0.033	0.033
S73A003	UMUS*197	ANTRC	LT	0.033	0.033
S73A003D	UMUS*219	ANTRC	LT	0.033	0.033
S74A003D	UMUS*217	ANTRC	LT	0.033	0.033
STAA020	UMUS*84	ANTRC	LT	0.033	0.033
STAA020D	UMUS*220	ANTRC	LT	0.033	0.033
STAA030	UMUS*125	ANTRC	LT	0.300	0.033
STAA030D	UMUS*221	ANTRC	LT	0.300	0.033
S73A001	UMUS*187	B2CEXM	LT	0.600	0.059
S73A001D	UMUS*218	B2CEXM	LT	0.059	0.059
S73A003	UMUS*197	B2CEXM	LT	0.059	0.059
S73A003D	UMUS*219	B2CEXM	LT	0.059	0.059
S74A003D	UMUS*217	B2CEXM	LT	0.059	0.059
STAA020	UMUS*84	B2CEXM	LT	0.059	0.059
STAA020D	UMUS*220	B2CEXM	LT	0.059	0.059
STAA030	UMUS*125	B2CEXM	LT	0.600	0.059
STAA030D	UMUS*221	B2CEXM	LT	0.600	0.059
S73A001	UMUS*187	B2CIPE	LT	2.000	0.200
S73A001D	UMUS*218	B2CIPE	LT	0.200	0.200
S73A003	UMUS*197	B2CIPE	LT	0.200	0.200
S73A003D	UMUS*219	B2CIPE	LT	0.200	0.200
S74A003D	UMUS*217	B2CIPE	LT	0.200	0.200
STAA020	UMUS*84	B2CIPE	LT	0.200	0.200
STAA020D	UMUS*220	B2CIPE	LT	0.200	0.200
STAA030	UMUS*125	B2CIPE	LT	2.000	0.200
STAA030D	UMUS*221	B2CIPE	LT	2.000	0.200
S73A001	UMUS*187	B2CLEE	LT	0.300	0.033
S73A001D	UMUS*218	B2CLEE	LT	0.033	0.033
S73A003	UMUS*197	B2CLEE	LT	0.033	0.033
S73A003D	UMUS*219	B2CLEE	LT	0.033	0.033
S74A003D	UMUS*217	B2CLEE	LT	0.033	0.033
STAA020	UMUS*84	B2CLEE	LT	0.033	0.033
STAA020D	UMUS*220	B2CLEE	LT	0.033	0.033
STAA030	UMUS*125	B2CLEE	LT	0.300	0.033
STAA030D	UMUS*221	B2CLEE	LT	0.300	0.033
S73A001	UMUS*187	B2EHP	LT	6.000	0.620
S73A001D	UMUS*218	B2EHP	LT	0.620	0.620
S73A003	UMUS*197	B2EHP	LT	0.620	0.620
S73A003D	UMUS*219	B2EHP	LT	0.620	0.620
S74A003D	UMUS*217	B2EHP		1.200	0.620
STAA020	UMUS*84	B2EHP	LT	0.620	0.620
STAA020D	UMUS*220	B2EHP	LT	0.620	0.620
STAA030	UMUS*125	B2EHP	LT	6.000	0.620
STAA030D	UMUS*221	B2EHP	LT	6.000	0.620

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A001	UMUS*187	BAANTR	LT	2.000	0.170
S73A001D	UMUS*218	BAANTR	LT	0.170	0.170
S73A003	UMUS*197	BAANTR	LT	0.170	0.170
S73A003D	UMUS*219	BAANTR	LT	0.170	0.170
S74A003D	UMUS*217	BAANTR	LT	0.170	0.170
STAA020	UMUS*84	BAANTR	LT	0.170	0.170
STAA020D	UMUS*220	BAANTR	LT	0.170	0.170
STAA030	UMUS*125	BAANTR	LT	2.000	0.170
STAA030D	UMUS*221	BAANTR	LT	2.000	0.170
S73A001	UMUS*187	BAPYR	LT	2.000	0.250
S73A001D	UMUS*218	BAPYR	LT	0.250	0.250
S73A003	UMUS*197	BAPYR	LT	0.250	0.250
S73A003D	UMUS*219	BAPYR	LT	0.250	0.250
S74A003D	UMUS*217	BAPYR	LT	0.250	0.250
STAA020	UMUS*84	BAPYR	LT	0.250	0.250
STAA020D	UMUS*220	BAPYR	LT	0.250	0.250
STAA030	UMUS*125	BAPYR	LT	2.000	0.250
STAA030D	UMUS*221	BAPYR	LT	2.000	0.250
S73A001	UMUS*187	BBFANT	LT	2.000	0.210
S73A001D	UMUS*218	BBFANT	LT	0.210	0.210
S73A003	UMUS*197	BBFANT	LT	0.210	0.210
S73A003D	UMUS*219	BBFANT	LT	0.210	0.210
S74A003D	UMUS*217	BBFANT	LT	0.210	0.210
STAA020	UMUS*84	BBFANT	LT	0.210	0.210
STAA020D	UMUS*220	BBFANT	LT	0.210	0.210
STAA030	UMUS*125	BBFANT	LT	2.000	0.210
STAA030D	UMUS*221	BBFANT	LT	2.000	0.210
S73A001	UMUS*187	BBHC	ND	3.000	0.270
S73A001D	UMUS*218	BBHC	ND	0.270	0.270
S73A003	UMUS*197	BBHC	ND	0.270	0.270
S73A003D	UMUS*219	BBHC	ND	0.270	0.270
S74A003D	UMUS*217	BBHC	ND	0.270	0.270
STAA020	UMUS*84	BBHC	ND	0.270	0.270
STAA020D	UMUS*220	BBHC	ND	0.270	0.270
STAA030	UMUS*125	BBHC	ND	3.000	0.270
STAA030D	UMUS*221	BBHC	ND	3.000	0.270
S73A001	UMUS*187	BBZP	LT	2.000	0.170
S73A001D	UMUS*218	BBZP	LT	0.170	0.170
S73A003	UMUS*197	BBZP	LT	0.170	0.170
S73A003D	UMUS*219	BBZP	LT	0.170	0.170
S74A003D	UMUS*217	BBZP	LT	0.170	0.170
STAA020	UMUS*84	BBZP	LT	0.170	0.170
STAA020D	UMUS*220	BBZP	LT	0.170	0.170
STAA030	UMUS*125	BBZP	LT	2.000	0.170
STAA030D	UMUS*221	BBZP	LT	2.000	0.170
S73A001	UMUS*187	BENSLF	ND	6.000	0.620
S73A001D	UMUS*218	BENSLF	ND	0.620	0.620
S73A003	UMUS*197	BENSLF	ND	0.620	0.620
S73A003D	UMUS*219	BENSLF	ND	0.620	0.620
S74A003D	UMUS*217	BENSLF	ND	0.620	0.620
STAA020	UMUS*84	BENSLF	ND	0.620	0.620
STAA020D	UMUS*220	BENSLF	ND	0.620	0.620

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA030	UMUS*125	BENSLF	ND	6.000	0.620
STAA030D	UMUS*221	BENSLF	ND	6.000	0.620
S73A001	UMUS*187	BENZID	ND	9.000	0.000
S73A001D	UMUS*218	BENZID	ND	0.850	0.000
S73A003	UMUS*197	BENZID	ND	0.850	0.000
S73A003D	UMUS*219	BENZID	ND	0.850	0.000
S74A003D	UMUS*217	BENZID	ND	0.850	0.000
STAA020	UMUS*84	BENZID	ND	0.850	0.000
STAA020D	UMUS*220	BENZID	ND	0.850	0.000
STAA030	UMUS*125	BENZID	ND	9.000	0.000
STAA030D	UMUS*221	BENZID	ND	9.000	0.000
S73A001	UMUS*187	BENZOA	ND	60.000	6.100
S73A001D	UMUS*218	BENZOA	ND	6.100	6.100
S73A003	UMUS*197	BENZOA	ND	6.100	6.100
S73A003D	UMUS*219	BENZOA	ND	6.100	6.100
S74A003D	UMUS*217	BENZOA	ND	6.100	6.100
STAA020	UMUS*84	BENZOA	ND	6.100	6.100
STAA020D	UMUS*220	BENZOA	ND	6.100	6.100
STAA030	UMUS*125	BENZOA	ND	60.000	6.100
STAA030D	UMUS*221	BENZOA	ND	60.000	6.100
S73A001	UMUS*187	BGHIPY	LT	2.000	0.250
S73A001D	UMUS*218	BGHIPY	LT	0.250	0.250
S73A003	UMUS*197	BGHIPY	LT	0.250	0.250
S73A003D	UMUS*219	BGHIPY	LT	0.250	0.250
S74A003D	UMUS*217	BGHIPY	LT	0.250	0.250
STAA020	UMUS*84	BGHIPY	LT	0.250	0.250
STAA020D	UMUS*220	BGHIPY	LT	0.250	0.250
STAA030	UMUS*125	BGHIPY	LT	2.000	0.250
STAA030D	UMUS*221	BGHIPY	LT	2.000	0.250
S73A001	UMUS*187	BKFANT	LT	0.700	0.066
S73A001D	UMUS*218	BKFANT	LT	0.066	0.066
S73A003	UMUS*197	BKFANT	LT	0.066	0.066
S73A003D	UMUS*219	BKFANT	LT	0.066	0.066
S74A003D	UMUS*217	BKFANT	LT	0.066	0.066
STAA020	UMUS*84	BKFANT	LT	0.066	0.066
STAA020D	UMUS*220	BKFANT	LT	0.066	0.066
STAA030	UMUS*125	BKFANT	LT	0.700	0.066
STAA030D	UMUS*221	BKFANT	LT	0.700	0.066
S73A001	UMUS*187	BZALC	LT	2.000	0.190
S73A001D	UMUS*218	BZALC	LT	0.190	0.190
S73A003	UMUS*197	BZALC	LT	0.190	0.190
S73A003D	UMUS*219	BZALC	LT	0.190	0.190
S74A003D	UMUS*217	BZALC	LT	0.190	0.190
STAA020	UMUS*84	BZALC	LT	0.190	0.190
STAA020D	UMUS*220	BZALC	LT	0.190	0.190
STAA030	UMUS*125	BZALC	LT	2.000	0.190
STAA030D	UMUS*221	BZALC	LT	2.000	0.190
S74A003D	UMUS*217	C17		0.310	0.000
S73A001	UMUS*187	CARBAZ	ND	1.000	0.000
S73A001D	UMUS*218	CARBAZ	ND	0.100	0.000
S73A003	UMUS*197	CARBAZ	ND	0.100	0.000
S73A003D	UMUS*219	CARBAZ	ND	0.100	0.000
S74A003D	UMUS*217	CARBAZ	ND	0.100	0.000

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA020	UMUS*84	CARBAZ	ND	0.100	0.000
STAA020D	UMUS*220	CARBAZ	ND	0.100	0.000
STAA030	UMUS*125	CARBAZ	ND	1.000	0.000
STAA030D	UMUS*221	CARBAZ	ND	1.000	0.000
S73A001	UMUS*187	CHRY	LT	1.000	0.120
S73A001D	UMUS*218	CHRY	LT	0.120	0.120
S73A003	UMUS*197	CHRY	LT	0.120	0.120
S73A003D	UMUS*219	CHRY	LT	0.120	0.120
S74A003D	UMUS*217	CHRY	LT	0.120	0.120
STAA020	UMUS*84	CHRY	LT	0.120	0.120
STAA020D	UMUS*220	CHRY	LT	0.120	0.120
STAA030	UMUS*125	CHRY	LT	1.000	0.120
STAA030D	UMUS*221	CHRY	LT	1.000	0.120
S73A001	UMUS*187	CL6BZ	LT	0.300	0.033
S73A001D	UMUS*218	CL6BZ	LT	0.033	0.033
S73A003	UMUS*197	CL6BZ	LT	0.033	0.033
S73A003D	UMUS*219	CL6BZ	LT	0.033	0.033
S74A003D	UMUS*217	CL6BZ	LT	0.033	0.033
STAA020	UMUS*84	CL6BZ	LT	0.033	0.033
STAA020D	UMUS*220	CL6BZ	LT	0.033	0.033
STAA030	UMUS*125	CL6BZ	LT	0.300	0.033
STAA030D	UMUS*221	CL6BZ	LT	0.300	0.033
S73A001	UMUS*187	CL6CP	LT	60.000	6.200
S73A001D	UMUS*218	CL6CP	LT	6.200	6.200
S73A003	UMUS*197	CL6CP	LT	6.200	6.200
S73A003D	UMUS*219	CL6CP	LT	6.200	6.200
S74A003D	UMUS*217	CL6CP	LT	6.200	6.200
STAA020	UMUS*84	CL6CP	LT	6.200	6.200
STAA020D	UMUS*220	CL6CP	LT	6.200	6.200
STAA030	UMUS*125	CL6CP	LT	60.000	6.200
STAA030D	UMUS*221	CL6CP	LT	60.000	6.200
S73A001	UMUS*187	CL6ET	LT	2.000	0.150
S73A001D	UMUS*218	CL6ET	LT	0.150	0.150
S73A003	UMUS*197	CL6ET	LT	0.150	0.150
S73A003D	UMUS*219	CL6ET	LT	0.150	0.150
S74A003D	UMUS*217	CL6ET	LT	0.150	0.150
STAA020	UMUS*84	CL6ET	LT	0.150	0.150
STAA020D	UMUS*220	CL6ET	LT	0.150	0.150
STAA030	UMUS*125	CL6ET	LT	2.000	0.150
STAA030D	UMUS*221	CL6ET	LT	2.000	0.150
S73A001	UMUS*187	DBAHA	LT	2.000	0.210
S73A001D	UMUS*218	DBAHA	LT	0.210	0.210
S73A003	UMUS*197	DBAHA	LT	0.210	0.210
S73A003D	UMUS*219	DBAHA	LT	0.210	0.210
S74A003D	UMUS*217	DBAHA	LT	0.210	0.210
STAA020	UMUS*84	DBAHA	LT	0.210	0.210
STAA020D	UMUS*220	DBAHA	LT	0.210	0.210
STAA030	UMUS*125	DBAHA	LT	2.000	0.210
STAA030D	UMUS*221	DBAHA	LT	2.000	0.210
S73A001	UMUS*187	DBHC	ND	3.000	0.270
S73A001D	UMUS*218	DBHC	ND	0.270	0.270
S73A003	UMUS*197	DBHC	ND	0.270	0.270
S73A003D	UMUS*219	DBHC	ND	0.270	0.270

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003D	UMUS*217	DBHC	ND	0.270	0.270
STAA020	UMUS*84	DBHC	ND	0.270	0.270
STAA020D	UMUS*220	DBHC	ND	0.270	0.270
STAA030	UMUS*125	DBHC	ND	3.000	0.270
STAA030D	UMUS*221	DBHC	ND	3.000	0.270
S73A001	UMUS*187	DBZFUR	LT	0.400	0.035
S73A001D	UMUS*218	DBZFUR	LT	0.035	0.035
S73A003	UMUS*197	DBZFUR	LT	0.035	0.035
S73A003D	UMUS*219	DBZFUR	LT	0.035	0.035
S74A003D	UMUS*217	DBZFUR	LT	0.035	0.035
STAA020	UMUS*84	DBZFUR	LT	0.035	0.035
STAA020D	UMUS*220	DBZFUR	LT	0.035	0.035
STAA030	UMUS*125	DBZFUR	LT	0.400	0.035
STAA030D	UMUS*221	DBZFUR	LT	0.400	0.035
S73A001	UMUS*187	DEP	LT	2.000	0.240
S73A001D	UMUS*218	DEP	LT	0.240	0.240
S73A003	UMUS*197	DEP	LT	0.240	0.240
S73A003D	UMUS*219	DEP	LT	0.240	0.240
S74A003D	UMUS*217	DEP	LT	0.240	0.240
STAA020	UMUS*84	DEP	LT	0.240	0.240
STAA020D	UMUS*220	DEP	LT	0.240	0.240
STAA030	UMUS*125	DEP	LT	2.000	0.240
STAA030D	UMUS*221	DEP	LT	2.000	0.240
S73A001	UMUS*187	DLDRN	ND	3.000	0.310
S73A001D	UMUS*218	DLDRN	ND	0.310	0.310
S73A003	UMUS*197	DLDRN	ND	0.310	0.310
S73A003D	UMUS*219	DLDRN	ND	0.310	0.310
S74A003D	UMUS*217	DLDRN	ND	0.310	0.310
STAA020	UMUS*84	DLDRN	ND	0.310	0.310
STAA020D	UMUS*220	DLDRN	ND	0.310	0.310
STAA030	UMUS*125	DLDRN	ND	3.000	0.310
STAA030D	UMUS*221	DLDRN	ND	3.000	0.310
S73A001	UMUS*187	DMP	LT	2.000	0.170
S73A001D	UMUS*218	DMP	LT	0.170	0.170
S73A003	UMUS*197	DMP	LT	0.170	0.170
S73A003D	UMUS*219	DMP	LT	0.170	0.170
S74A003D	UMUS*217	DMP	LT	0.170	0.170
STAA020	UMUS*84	DMP	LT	0.170	0.170
STAA020D	UMUS*220	DMP	LT	0.170	0.170
STAA030	UMUS*125	DMP	LT	2.000	0.170
STAA030D	UMUS*221	DMP	LT	2.000	0.170
S73A001	UMUS*187	DNBP	LT	0.600	0.061
S73A001D	UMUS*218	DNBP	LT	0.061	0.061
S73A003	UMUS*197	DNBP	LT	0.061	0.061
S73A003D	UMUS*219	DNBP	LT	0.061	0.061
S74A003D	UMUS*217	DNBP		20.000	0.061
STAA020	UMUS*84	DNBP	LT	0.061	0.061
STAA020D	UMUS*220	DNBP	LT	0.061	0.061
STAA030	UMUS*125	DNBP	LT	0.600	0.061
STAA030D	UMUS*221	DNBP	LT	0.600	0.061
S73A001	UMUS*187	DNOP	LT	2.000	0.190
S73A001D	UMUS*218	DNOP	LT	0.190	0.190

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A003	UMUS*197	DNOP	LT	0.190	0.190
S73A003D	UMUS*219	DNOP	LT	0.190	0.190
S74A003D	UMUS*217	DNOP	LT	0.190	0.190
STAA020	UMUS*84	DNOP	LT	0.190	0.190
STAA020D	UMUS*220	DNOP	LT	0.190	0.190
STAA030	UMUS*125	DNOP	LT	2.000	0.190
STAA030D	UMUS*221	DNOP	LT	2.000	0.190
S74A003D	UMUS*217	DOAD		21.000	0.000
S73A001	UMUS*187	ENDRN	ND	5.000	0.450
S73A001D	UMUS*218	ENDRN	ND	0.450	0.450
S73A003	UMUS*197	ENDRN	ND	0.450	0.450
S73A003D	UMUS*219	ENDRN	ND	0.450	0.450
S74A003D	UMUS*217	ENDRN	ND	0.450	0.450
STAA020	UMUS*84	ENDRN	ND	0.450	0.450
STAA020D	UMUS*220	ENDRN	ND	0.450	0.450
STAA030	UMUS*125	ENDRN	ND	5.000	0.450
STAA030D	UMUS*221	ENDRN	ND	5.000	0.450
S73A001	UMUS*187	ENDRNA	ND	5.000	0.000
S73A001D	UMUS*218	ENDRNA	ND	0.530	0.000
S73A003	UMUS*197	ENDRNA	ND	0.530	0.000
S73A003D	UMUS*219	ENDRNA	ND	0.530	0.000
S74A003D	UMUS*217	ENDRNA	ND	0.530	0.000
STAA020	UMUS*84	ENDRNA	ND	0.530	0.000
STAA020D	UMUS*220	ENDRNA	ND	0.530	0.000
STAA030	UMUS*125	ENDRNA	ND	5.000	0.000
STAA030D	UMUS*221	ENDRNA	ND	5.000	0.000
S73A001	UMUS*187	ENDRNK	ND	5.000	0.530
S73A001D	UMUS*218	ENDRNK	ND	0.530	0.530
S73A003	UMUS*197	ENDRNK	ND	0.530	0.530
S73A003D	UMUS*219	ENDRNK	ND	0.530	0.530
S74A003D	UMUS*217	ENDRNK	ND	0.530	0.530
STAA020	UMUS*84	ENDRNK	ND	0.530	0.530
STAA020D	UMUS*220	ENDRNK	ND	0.530	0.530
STAA030	UMUS*125	ENDRNK	ND	5.000	0.530
STAA030D	UMUS*221	ENDRNK	ND	5.000	0.530
S73A001	UMUS*187	ESFSO4	ND	6.000	0.620
S73A001D	UMUS*218	ESFSO4	ND	0.620	0.620
S73A003	UMUS*197	ESFSO4	ND	0.620	0.620
S73A003D	UMUS*219	ESFSO4	ND	0.620	0.620
S74A003D	UMUS*217	ESFSO4	ND	0.620	0.620
STAA020	UMUS*84	ESFSO4	ND	0.620	0.620
STAA020D	UMUS*220	ESFSO4	ND	0.620	0.620
STAA030	UMUS*125	ESFSO4	ND	6.000	0.620
STAA030D	UMUS*221	ESFSO4	ND	6.000	0.620
S73A001	UMUS*187	FANT	LT	0.700	0.068
S73A001D	UMUS*218	FANT	LT	0.068	0.068
S73A003	UMUS*197	FANT	LT	0.068	0.068
S73A003D	UMUS*219	FANT	LT	0.068	0.068
S74A003D	UMUS*217	FANT	LT	0.068	0.068
STAA020	UMUS*84	FANT	LT	0.068	0.068
STAA020D	UMUS*220	FANT	LT	0.068	0.068
STAA030	UMUS*125	FANT		0.900	0.068
STAA030D	UMUS*221	FANT	LT	0.700	0.068

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A001	UMUS*187	FLRENE	LT	0.300	0.033
S73A001D	UMUS*218	FLRENE	LT	0.033	0.033
S73A003	UMUS*197	FLRENE	LT	0.033	0.033
S73A003D	UMUS*219	FLRENE	LT	0.033	0.033
S74A003D	UMUS*217	FLRENE	LT	0.033	0.033
STAA020	UMUS*84	FLRENE	LT	0.033	0.033
STAA020D	UMUS*220	FLRENE	LT	0.033	0.033
STAA030	UMUS*125	FLRENE	LT	0.300	0.033
STAA030D	UMUS*221	FLRENE	LT	0.300	0.033
S73A001	UMUS*187	GCLDAN	ND	3.000	0.330
S73A001D	UMUS*218	GCLDAN	ND	0.330	0.330
S73A003	UMUS*197	GCLDAN	ND	0.330	0.330
S73A003D	UMUS*219	GCLDAN	ND	0.330	0.330
S74A003D	UMUS*217	GCLDAN	ND	0.330	0.330
STAA020	UMUS*84	GCLDAN	ND	0.330	0.330
STAA020D	UMUS*220	GCLDAN	ND	0.330	0.330
STAA030	UMUS*125	GCLDAN	ND	3.000	0.330
STAA030D	UMUS*221	GCLDAN	ND	3.000	0.330
S73A001	UMUS*187	HCBD	LT	2.000	0.230
S73A001D	UMUS*218	HCBD	LT	0.230	0.230
S73A003	UMUS*197	HCBD	LT	0.230	0.230
S73A003D	UMUS*219	HCBD	LT	0.230	0.230
S74A003D	UMUS*217	HCBD	LT	0.230	0.230
STAA020	UMUS*84	HCBD	LT	0.230	0.230
STAA020D	UMUS*220	HCBD	LT	0.230	0.230
STAA030	UMUS*125	HCBD	LT	2.000	0.230
STAA030D	UMUS*221	HCBD	LT	2.000	0.230
S73A001	UMUS*187	HPCL	ND	1.000	0.130
S73A001D	UMUS*218	HPCL	ND	0.130	0.130
S73A003	UMUS*197	HPCL	ND	0.130	0.130
S73A003D	UMUS*219	HPCL	ND	0.130	0.130
S74A003D	UMUS*217	HPCL	ND	0.130	0.130
STAA020	UMUS*84	HPCL	ND	0.130	0.130
STAA020D	UMUS*220	HPCL	ND	0.130	0.130
STAA030	UMUS*125	HPCL	ND	1.000	0.130
STAA030D	UMUS*221	HPCL	ND	1.000	0.130
S73A001	UMUS*187	HPCLE	ND	3.000	0.330
S73A001D	UMUS*218	HPCLE	ND	0.330	0.330
S73A003	UMUS*197	HPCLE	ND	0.330	0.330
S73A003D	UMUS*219	HPCLE	ND	0.330	0.330
S74A003D	UMUS*217	HPCLE	ND	0.330	0.330
STAA020	UMUS*84	HPCLE	ND	0.330	0.330
STAA020D	UMUS*220	HPCLE	ND	0.330	0.330
STAA030	UMUS*125	HPCLE	ND	3.000	0.330
STAA030D	UMUS*221	HPCLE	ND	3.000	0.330
S73A001	UMUS*187	ICDPYR	LT	3.000	0.290
S73A001D	UMUS*218	ICDPYR	LT	0.290	0.290
S73A003	UMUS*197	ICDPYR	LT	0.290	0.290
S73A003D	UMUS*219	ICDPYR	LT	0.290	0.290
S74A003D	UMUS*217	ICDPYR	LT	0.290	0.290
STAA020	UMUS*84	ICDPYR	LT	0.290	0.290
STAA020D	UMUS*220	ICDPYR	LT	0.290	0.290

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA030	UMUS*125	ICDPYR	LT	3.000	0.290
STAA030D	UMUS*221	ICDPYR	LT	3.000	0.290
S73A001	UMUS*187	ISOPHR	LT	0.300	0.033
S73A001D	UMUS*218	ISOPHR	LT	0.033	0.033
S73A003	UMUS*197	ISOPHR	LT	0.033	0.033
S73A003D	UMUS*219	ISOPHR	LT	0.033	0.033
S74A003D	UMUS*217	ISOPHR	LT	0.033	0.033
STAA020	UMUS*84	ISOPHR	LT	0.033	0.033
STAA020D	UMUS*220	ISOPHR	LT	0.033	0.033
STAA030	UMUS*125	ISOPHR	LT	0.300	0.033
STAA030D	UMUS*221	ISOPHR	LT	0.300	0.033
S73A001	UMUS*187	LIN	ND	3.000	0.270
S73A001D	UMUS*218	LIN	ND	0.270	0.270
S73A003	UMUS*197	LIN	ND	0.270	0.270
S73A003D	UMUS*219	LIN	ND	0.270	0.270
S74A003D	UMUS*217	LIN	ND	0.270	0.270
STAA020	UMUS*84	LIN	ND	0.270	0.270
STAA020D	UMUS*220	LIN	ND	0.270	0.270
STAA030	UMUS*125	LIN	ND	3.000	0.270
STAA030D	UMUS*221	LIN	ND	3.000	0.270
S73A001	UMUS*187	MEXCLR	ND	3.000	0.330
S73A001D	UMUS*218	MEXCLR	ND	0.330	0.330
S73A003	UMUS*197	MEXCLR	ND	0.330	0.330
S73A003D	UMUS*219	MEXCLR	ND	0.330	0.330
S74A003D	UMUS*217	MEXCLR	ND	0.330	0.330
STAA020	UMUS*84	MEXCLR	ND	0.330	0.330
STAA020D	UMUS*220	MEXCLR	ND	0.330	0.330
STAA030	UMUS*125	MEXCLR	ND	3.000	0.330
STAA030D	UMUS*221	MEXCLR	ND	3.000	0.330
S73A001	UMUS*187	NAP	LT	0.400	0.037
S73A001D	UMUS*218	NAP	LT	0.037	0.037
S73A003	UMUS*197	NAP	LT	0.037	0.037
S73A003D	UMUS*219	NAP	LT	0.037	0.037
S74A003D	UMUS*217	NAP	LT	0.037	0.037
STAA020	UMUS*84	NAP	LT	0.037	0.037
STAA020D	UMUS*220	NAP	LT	0.037	0.037
STAA030	UMUS*125	NAP	LT	0.400	0.037
STAA030D	UMUS*221	NAP	LT	0.400	0.037
S73A001	UMUS*187	NB	LT	0.400	0.045
S73A001D	UMUS*218	NB	LT	0.045	0.045
S73A003	UMUS*197	NB	LT	0.045	0.045
S73A003D	UMUS*219	NB	LT	0.045	0.045
S74A003D	UMUS*217	NB	LT	0.045	0.045
STAA020	UMUS*84	NB	LT	0.045	0.045
STAA020D	UMUS*220	NB	LT	0.045	0.045
STAA030	UMUS*125	NB	LT	0.400	0.045
STAA030D	UMUS*221	NB	LT	0.400	0.045
S73A001	UMUS*187	NNDMEA	ND	1.000	0.000
S73A001D	UMUS*218	NNDMEA	ND	0.140	0.000
S73A003	UMUS*197	NNDMEA	ND	0.140	0.000
S73A003D	UMUS*219	NNDMEA	ND	0.140	0.000
S74A003D	UMUS*217	NNDMEA	ND	0.140	0.000

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA020	UMUS*84	NNDMEA	ND	0.140	0.000
STAA020D	UMUS*220	NNDMEA	ND	0.140	0.000
STAA030	UMUS*125	NNDMEA	ND	1.000	0.000
STAA030D	UMUS*221	NNDMEA	ND	1.000	0.000
S73A001	UMUS*187	NNDNPA	LT	2.000	0.200
S73A001D	UMUS*218	NNDNPA	LT	0.200	0.200
S73A003	UMUS*197	NNDNPA	LT	0.200	0.200
S73A003D	UMUS*219	NNDNPA	LT	0.200	0.200
S74A003D	UMUS*217	NNDNPA	LT	0.200	0.200
STAA020	UMUS*84	NNDNPA	LT	0.200	0.200
STAA020D	UMUS*220	NNDNPA	LT	0.200	0.200
STAA030	UMUS*125	NNDNPA	LT	2.000	0.200
STAA030D	UMUS*221	NNDNPA	LT	2.000	0.200
S73A001	UMUS*187	NNDPA	LT	2.000	0.190
S73A001D	UMUS*218	NNDPA	LT	0.190	0.190
S73A003	UMUS*197	NNDPA	LT	0.190	0.190
S73A003D	UMUS*219	NNDPA	LT	0.190	0.190
S74A003D	UMUS*217	NNDPA	LT	0.190	0.190
STAA020	UMUS*84	NNDPA	LT	0.190	0.190
STAA020D	UMUS*220	NNDPA	LT	0.190	0.190
STAA030	UMUS*125	NNDPA	LT	2.000	0.190
STAA030D	UMUS*221	NNDPA	LT	2.000	0.190
S73A001	UMUS*187	PCB016	ND	10.000	1.400
S73A001D	UMUS*218	PCB016	ND	1.400	1.400
S73A003	UMUS*197	PCB016	ND	1.400	1.400
S73A003D	UMUS*219	PCB016	ND	1.400	1.400
S74A003D	UMUS*217	PCB016	ND	1.400	1.400
STAA020	UMUS*84	PCB016	ND	1.400	1.400
STAA020D	UMUS*220	PCB016	ND	1.400	1.400
STAA030	UMUS*125	PCB016	ND	10.000	1.400
STAA030D	UMUS*221	PCB016	ND	10.000	1.400
S73A001	UMUS*187	PCB221	ND	10.000	1.400
S73A001D	UMUS*218	PCB221	ND	1.400	1.400
S73A003	UMUS*197	PCB221	ND	1.400	1.400
S73A003D	UMUS*219	PCB221	ND	1.400	1.400
S74A003D	UMUS*217	PCB221	ND	1.400	1.400
STAA020	UMUS*84	PCB221	ND	1.400	1.400
STAA020D	UMUS*220	PCB221	ND	1.400	1.400
STAA030	UMUS*125	PCB221	ND	10.000	1.400
STAA030D	UMUS*221	PCB221	ND	10.000	1.400
S73A001	UMUS*187	PCB232	ND	10.000	1.400
S73A001D	UMUS*218	PCB232	ND	1.400	1.400
S73A003	UMUS*197	PCB232	ND	1.400	1.400
S73A003D	UMUS*219	PCB232	ND	1.400	1.400
S74A003D	UMUS*217	PCB232	ND	1.400	1.400
STAA020	UMUS*84	PCB232	ND	1.400	1.400
STAA020D	UMUS*220	PCB232	ND	1.400	1.400
STAA030	UMUS*125	PCB232	ND	10.000	1.400
STAA030D	UMUS*221	PCB232	ND	10.000	1.400
S73A001	UMUS*187	PCB242	ND	10.000	1.400
S73A001D	UMUS*218	PCB242	ND	1.400	1.400
S73A003	UMUS*197	PCB242	ND	1.400	1.400
S73A003D	UMUS*219	PCB242	ND	1.400	1.400

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003D	UMUS*217	PCB242	ND	1.400	1.400
STAA020	UMUS*84	PCB242	ND	1.400	1.400
STAA020D	UMUS*220	PCB242	ND	1.400	1.400
STAA030	UMUS*125	PCB242	ND	10.000	1.400
STAA030D	UMUS*221	PCB242	ND	10.000	1.400
S73A001	UMUS*187	PCB248	ND	20.000	2.000
S73A001D	UMUS*218	PCB248	ND	2.000	2.000
S73A003	UMUS*197	PCB248	ND	2.000	2.000
S73A003D	UMUS*219	PCB248	ND	2.000	2.000
S74A003D	UMUS*217	PCB248	ND	2.000	2.000
STAA020	UMUS*84	PCB248	ND	2.000	2.000
STAA020D	UMUS*220	PCB248	ND	2.000	2.000
STAA030	UMUS*125	PCB248	ND	20.000	2.000
STAA030D	UMUS*221	PCB248	ND	20.000	2.000
S73A001	UMUS*187	PCB254	ND	20.000	2.300
S73A001D	UMUS*218	PCB254	ND	2.300	2.300
S73A003	UMUS*197	PCB254	ND	2.300	2.300
S73A003D	UMUS*219	PCB254	ND	2.300	2.300
S74A003D	UMUS*217	PCB254	ND	2.300	2.300
STAA020	UMUS*84	PCB254	ND	2.300	2.300
STAA020D	UMUS*220	PCB254	ND	2.300	2.300
STAA030	UMUS*125	PCB254	ND	20.000	2.300
STAA030D	UMUS*221	PCB254	ND	20.000	2.300
S73A001	UMUS*187	PCB260	ND	30.000	2.600
S73A001D	UMUS*218	PCB260	ND	2.600	2.600
S73A003	UMUS*197	PCB260	ND	2.600	2.600
S73A003D	UMUS*219	PCB260	ND	2.600	2.600
S74A003D	UMUS*217	PCB260	ND	2.600	2.600
STAA020	UMUS*84	PCB260	ND	2.600	2.600
STAA020D	UMUS*220	PCB260	ND	2.600	2.600
STAA030	UMUS*125	PCB260	ND	30.000	2.600
STAA030D	UMUS*221	PCB260	ND	30.000	2.600
S73A001	UMUS*187	PCP	LT	10.000	1.300
S73A001D	UMUS*218	PCP	LT	1.300	1.300
S73A003	UMUS*197	PCP	LT	1.300	1.300
S73A003D	UMUS*219	PCP	LT	1.300	1.300
S74A003D	UMUS*217	PCP	LT	1.300	1.300
STAA020	UMUS*84	PCP	LT	1.300	1.300
STAA020D	UMUS*220	PCP	LT	1.300	1.300
STAA030	UMUS*125	PCP	LT	10.000	1.300
STAA030D	UMUS*221	PCP	LT	10.000	1.300
S73A001	UMUS*187	PHANTR	LT	0.300	0.033
S73A001D	UMUS*218	PHANTR	LT	0.033	0.033
S73A003	UMUS*197	PHANTR	LT	0.033	0.033
S73A003D	UMUS*219	PHANTR	LT	0.033	0.033
S74A003D	UMUS*217	PHANTR	LT	0.033	0.033
STAA020	UMUS*84	PHANTR	LT	0.033	0.033
STAA020D	UMUS*220	PHANTR	LT	0.033	0.033
STAA030	UMUS*125	PHANTR		0.400	0.033
STAA030D	UMUS*221	PHANTR	LT	0.300	0.033
S73A001	UMUS*187	PHENOL	LT	1.000	0.110
S73A001D	UMUS*218	PHENOL	LT	0.110	0.110

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A003	UMUS*197	PHENOL	LT	0.110	0.110
S73A003D	UMUS*219	PHENOL	LT	0.110	0.110
S74A003D	UMUS*217	PHENOL	LT	0.110	0.110
STAA020	UMUS*84	PHENOL	LT	0.110	0.110
STAA020D	UMUS*220	PHENOL	LT	0.110	0.110
STAA030	UMUS*125	PHENOL	LT	1.000	0.110
STAA030D	UMUS*221	PHENOL	LT	1.000	0.110
S73A001	UMUS*187	PPDDD	ND	3.000	0.300
S73A001D	UMUS*218	PPDDD	ND	0.270	0.300
S73A003	UMUS*197	PPDDD	ND	0.270	0.300
S73A003D	UMUS*219	PPDDD	ND	0.270	0.300
S74A003D	UMUS*217	PPDDD	ND	0.270	0.300
STAA020	UMUS*84	PPDDD	ND	0.270	0.300
STAA020D	UMUS*220	PPDDD	ND	0.270	0.300
STAA030	UMUS*125	PPDDD	ND	3.000	0.300
STAA030D	UMUS*221	PPDDD	ND	3.000	0.300
S73A001	UMUS*187	PPDDE	ND	3.000	0.310
S73A001D	UMUS*218	PPDDE	ND	0.310	0.310
S73A003	UMUS*197	PPDDE	ND	0.310	0.310
S73A003D	UMUS*219	PPDDE	ND	0.310	0.310
S74A003D	UMUS*217	PPDDE	ND	0.310	0.310
STAA020	UMUS*84	PPDDE	ND	0.310	0.310
STAA020D	UMUS*220	PPDDE	ND	0.310	0.310
STAA030	UMUS*125	PPDDE	ND	3.000	0.310
STAA030D	UMUS*221	PPDDE	ND	3.000	0.310
S73A001	UMUS*187	PPDDT	ND	3.000	0.310
S73A001D	UMUS*218	PPDDT	ND	0.310	0.310
S73A003	UMUS*197	PPDDT	ND	0.310	0.310
S73A003D	UMUS*219	PPDDT	ND	0.310	0.310
S74A003D	UMUS*217	PPDDT	ND	0.310	0.310
STAA020	UMUS*84	PPDDT	ND	0.310	0.310
STAA020D	UMUS*220	PPDDT	ND	0.310	0.310
STAA030	UMUS*125	PPDDT	ND	3.000	0.310
STAA030D	UMUS*221	PPDDT	ND	3.000	0.310
S73A001	UMUS*187	PYR	LT	0.300	0.033
S73A001D	UMUS*218	PYR	LT	0.033	0.033
S73A003	UMUS*197	PYR	LT	0.033	0.033
S73A003D	UMUS*219	PYR	LT	0.033	0.033
S74A003D	UMUS*217	PYR	LT	0.033	0.033
STAA020	UMUS*84	PYR	LT	0.033	0.033
STAA020D	UMUS*220	PYR	LT	0.033	0.033
STAA030	UMUS*125	PYR	LT	0.300	0.033
STAA030D	UMUS*221	PYR	LT	0.300	0.033
S73A001	UMUS*187	TXPHEN	ND	30.000	2.600
S73A001D	UMUS*218	TXPHEN	ND	2.600	2.600
S73A003	UMUS*197	TXPHEN	ND	2.600	2.600
S73A003D	UMUS*219	TXPHEN	ND	2.600	2.600
S74A003D	UMUS*217	TXPHEN	ND	2.600	2.600
STAA020	UMUS*84	TXPHEN	ND	2.600	2.600
STAA020D	UMUS*220	TXPHEN	ND	2.600	2.600
STAA030	UMUS*125	TXPHEN	ND	30.000	2.600
STAA030D	UMUS*221	TXPHEN	ND	30.000	2.600
STAA030D	UMUS*221	UNK543		3.000	0.000

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003D	UMUS*217	UNK560		0.300	0.000
S74A003D	UMUS*217	UNK597		0.200	0.000
S74A003D	UMUS*217	UNK602		1.000	0.000
S74A003D	UMUS*217	UNK613		0.300	0.000
S74A003D	UMUS*217	UNK615		0.300	0.000
S74A003D	UMUS*217	UNK617		0.700	0.000
S74A003D	UMUS*217	UNK621		0.700	0.000
S74A003D	UMUS*217	UNK626		0.600	0.000
S74A003D	UMUS*217	UNK629		0.300	0.000
S73A001	UMUS*187	111TCE	LT	0.004	0.004
S73A001D	UMUS*218	111TCE	LT	0.004	0.004
S73A003	UMUS*197	111TCE	LT	0.004	0.004
S73A003D	UMUS*219	111TCE	LT	0.004	0.004
S74A003	UMUS*212	111TCE	LT	0.004	0.004
S74A003D	UMUS*217	111TCE	LT	0.004	0.004
STAA020	UMUS*84	111TCE	LT	0.004	0.004
STAA020D	UMUS*220	111TCE	LT	0.004	0.004
STAA030	UMUS*125	111TCE	LT	0.004	0.004
STAA030D	UMUS*221	111TCE	LT	0.004	0.004
S73A001	UMUS*187	112TCE	LT	0.005	0.005
S73A001D	UMUS*218	112TCE	LT	0.005	0.005
S73A003	UMUS*197	112TCE	LT	0.005	0.005
S73A003D	UMUS*219	112TCE	LT	0.005	0.005
S74A003	UMUS*212	112TCE	LT	0.005	0.005
S74A003D	UMUS*217	112TCE	LT	0.005	0.005
STAA020	UMUS*84	112TCE	LT	0.005	0.005
STAA020D	UMUS*220	112TCE	LT	0.005	0.005
STAA030	UMUS*125	112TCE	LT	0.005	0.005
STAA030D	UMUS*221	112TCE	LT	0.005	0.005
S73A001	UMUS*187	11DCE	LT	0.004	0.004
S73A001D	UMUS*218	11DCE	LT	0.004	0.004
S73A003	UMUS*197	11DCE	LT	0.004	0.004
S73A003D	UMUS*219	11DCE	LT	0.004	0.004
S74A003	UMUS*212	11DCE	LT	0.004	0.004
S74A003D	UMUS*217	11DCE	LT	0.004	0.004
STAA020	UMUS*84	11DCE	LT	0.004	0.004
STAA020D	UMUS*220	11DCE	LT	0.004	0.004
STAA030	UMUS*125	11DCE	LT	0.004	0.004
STAA030D	UMUS*221	11DCE	LT	0.004	0.004
S73A001	UMUS*187	11DCLE	LT	0.002	0.002
S73A001D	UMUS*218	11DCLE	LT	0.002	0.002
S73A003	UMUS*197	11DCLE	LT	0.002	0.002
S73A003D	UMUS*219	11DCLE	LT	0.002	0.002
S74A003	UMUS*212	11DCLE	LT	0.002	0.002
S74A003D	UMUS*217	11DCLE	LT	0.002	0.002
STAA020	UMUS*84	11DCLE	LT	0.002	0.002
STAA020D	UMUS*220	11DCLE	LT	0.002	0.002
STAA030	UMUS*125	11DCLE	LT	0.002	0.002
STAA030D	UMUS*221	11DCLE	LT	0.002	0.002
S73A001	UMUS*187	12DCE	LT	0.003	0.003
S73A001D	UMUS*218	12DCE	LT	0.003	0.003
S73A003	UMUS*197	12DCE	LT	0.003	0.003
S73A003D	UMUS*219	12DCE	LT	0.003	0.003

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003	UMUS*212	12DCE	LT	0.003	0.003
S74A003D	UMUS*217	12DCE	LT	0.003	0.003
STAA020	UMUS*84	12DCE	LT	0.003	0.003
STAA020D	UMUS*220	12DCE	LT	0.003	0.003
STAA030	UMUS*125	12DCE	LT	0.003	0.003
STAA030D	UMUS*221	12DCE	LT	0.003	0.003
S73A001	UMUS*187	12DCLE	LT	0.002	0.002
S73A001D	UMUS*218	12DCLE	LT	0.002	0.002
S73A003	UMUS*197	12DCLE	LT	0.002	0.002
S73A003D	UMUS*219	12DCLE	LT	0.002	0.002
S74A003	UMUS*212	12DCLE	LT	0.002	0.002
S74A003D	UMUS*217	12DCLE	LT	0.002	0.002
STAA020	UMUS*84	12DCLE	LT	0.002	0.002
STAA020D	UMUS*220	12DCLE	LT	0.002	0.002
STAA030	UMUS*125	12DCLE	LT	0.002	0.002
STAA030D	UMUS*221	12DCLE	LT	0.002	0.002
S73A001	UMUS*187	12DCLP	LT	0.003	0.003
S73A001D	UMUS*218	12DCLP	LT	0.003	0.003
S73A003	UMUS*197	12DCLP	LT	0.003	0.003
S73A003D	UMUS*219	12DCLP	LT	0.003	0.003
S74A003	UMUS*212	12DCLP	LT	0.003	0.003
S74A003D	UMUS*217	12DCLP	LT	0.003	0.003
STAA020	UMUS*84	12DCLP	LT	0.003	0.003
STAA020D	UMUS*220	12DCLP	LT	0.003	0.003
STAA030	UMUS*125	12DCLP	LT	0.003	0.003
STAA030D	UMUS*221	12DCLP	LT	0.003	0.003
S73A001	UMUS*187	2CLEVE	ND	0.010	0.000
S73A001D	UMUS*218	2CLEVE	ND	0.010	0.000
S73A003	UMUS*197	2CLEVE	ND	0.010	0.000
S73A003D	UMUS*219	2CLEVE	ND	0.010	0.000
S74A003	UMUS*212	2CLEVE	ND	0.010	0.000
S74A003D	UMUS*217	2CLEVE	ND	0.010	0.000
STAA020	UMUS*84	2CLEVE	ND	0.010	0.000
STAA020D	UMUS*220	2CLEVE	ND	0.010	0.000
STAA030	UMUS*125	2CLEVE	ND	0.010	0.000
STAA030D	UMUS*221	2CLEVE	ND	0.010	0.000
S74A003D	UMUS*217	2E1HXL		0.010	0.000
S73A001	UMUS*187	ACET	LT	0.017	0.017
S73A001D	UMUS*218	ACET	LT	0.017	0.017
S73A003	UMUS*197	ACET	LT	0.017	0.017
S73A003D	UMUS*219	ACET	LT	0.017	0.017
S74A003	UMUS*212	ACET	LT	0.017	0.017
S74A003D	UMUS*217	ACET	LT	0.017	0.017
STAA020	UMUS*84	ACET	LT	0.017	0.017
STAA020D	UMUS*220	ACET	LT	0.017	0.017
STAA030	UMUS*125	ACET	LT	0.017	0.017
STAA030D	UMUS*221	ACET	LT	0.017	0.017
S73A001	UMUS*187	ACROLN	ND	0.100	0.000
S73A001D	UMUS*218	ACROLN	ND	0.100	0.000
S73A003	UMUS*197	ACROLN	ND	0.100	0.000
S73A003D	UMUS*219	ACROLN	ND	0.100	0.000
S74A003	UMUS*212	ACROLN	ND	0.100	0.000
S74A003D	UMUS*217	ACROLN	ND	0.100	0.000

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA020	UMUS*84	ACROLN	ND	0.100	0.000
STAA020D	UMUS*220	ACROLN	ND	0.100	0.000
STAA030	UMUS*125	ACROLN	ND	0.100	0.000
STAA030D	UMUS*221	ACROLN	ND	0.100	0.000
S73A001	UMUS*187	ACRYLO	ND	0.100	0.100
S73A001D	UMUS*218	ACRYLO	ND	0.100	0.100
S73A003	UMUS*197	ACRYLO	ND	0.100	0.100
S73A003D	UMUS*219	ACRYLO	ND	0.100	0.100
S74A003	UMUS*212	ACRYLO	ND	0.100	0.100
S74A003D	UMUS*217	ACRYLO	ND	0.100	0.100
STAA020	UMUS*84	ACRYLO	ND	0.100	0.100
STAA020D	UMUS*220	ACRYLO	ND	0.100	0.100
STAA030	UMUS*125	ACRYLO	ND	0.100	0.100
STAA030D	UMUS*221	ACRYLO	ND	0.100	0.100
S73A001	UMUS*187	BRDCLM	LT	0.003	0.003
S73A001D	UMUS*218	BRDCLM	LT	0.003	0.003
S73A003	UMUS*197	BRDCLM	LT	0.003	0.003
S73A003D	UMUS*219	BRDCLM	LT	0.003	0.003
S74A003	UMUS*212	BRDCLM	LT	0.003	0.003
S74A003D	UMUS*217	BRDCLM	LT	0.003	0.003
STAA020	UMUS*84	BRDCLM	LT	0.003	0.003
STAA020D	UMUS*220	BRDCLM	LT	0.003	0.003
STAA030	UMUS*125	BRDCLM	LT	0.003	0.003
STAA030D	UMUS*221	BRDCLM	LT	0.003	0.003
S73A001	UMUS*187	C13DCP	LT	0.003	0.003
S73A001D	UMUS*218	C13DCP	LT	0.003	0.003
S73A003	UMUS*197	C13DCP	LT	0.003	0.003
S73A003D	UMUS*219	C13DCP	LT	0.003	0.003
S74A003	UMUS*212	C13DCP	LT	0.003	0.003
S74A003D	UMUS*217	C13DCP	LT	0.003	0.003
STAA020	UMUS*84	C13DCP	LT	0.003	0.003
STAA020D	UMUS*220	C13DCP	LT	0.003	0.003
STAA030	UMUS*125	C13DCP	LT	0.003	0.003
STAA030D	UMUS*221	C13DCP	LT	0.003	0.003
S73A001	UMUS*187	C2AVE	LT	0.032	0.003
S73A001D	UMUS*218	C2AVE	LT	0.032	0.003
S73A003	UMUS*197	C2AVE	LT	0.032	0.003
S73A003D	UMUS*219	C2AVE	LT	0.032	0.003
S74A003	UMUS*212	C2AVE	LT	0.032	0.003
S74A003D	UMUS*217	C2AVE	LT	0.032	0.003
STAA020	UMUS*84	C2AVE	LT	0.032	0.003
STAA020D	UMUS*220	C2AVE	LT	0.032	0.003
STAA030	UMUS*125	C2AVE	LT	0.032	0.003
STAA030D	UMUS*221	C2AVE	LT	0.032	0.003
S73A001	UMUS*187	C2H3CL	LT	0.006	0.006
S73A001D	UMUS*218	C2H3CL	LT	0.006	0.006
S73A003	UMUS*197	C2H3CL	LT	0.006	0.006
S73A003D	UMUS*219	C2H3CL	LT	0.006	0.006
S74A003	UMUS*212	C2H3CL	LT	0.006	0.006
S74A003D	UMUS*217	C2H3CL	LT	0.006	0.006
STAA020	UMUS*84	C2H3CL	LT	0.006	0.006
STAA020D	UMUS*220	C2H3CL	LT	0.006	0.006

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA030	UMUS*125	C2H3CL	LT	0.006	0.006
STAA030D	UMUS*221	C2H3CL	LT	0.006	0.006
S73A001	UMUS*187	C2H5CL	LT	0.012	0.012
S73A001D	UMUS*218	C2H5CL	LT	0.012	0.012
S73A003	UMUS*197	C2H5CL	LT	0.012	0.012
S73A003D	UMUS*219	C2H5CL	LT	0.012	0.012
S74A003	UMUS*212	C2H5CL	LT	0.012	0.012
S74A003D	UMUS*217	C2H5CL	LT	0.012	0.012
STAA020	UMUS*84	C2H5CL	LT	0.012	0.012
STAA020D	UMUS*220	C2H5CL	LT	0.012	0.012
STAA030	UMUS*125	C2H5CL	LT	0.012	0.012
STAA030D	UMUS*221	C2H5CL	LT	0.012	0.012
S73A001	UMUS*187	C6H6	LT	0.002	0.002
S73A001D	UMUS*218	C6H6	LT	0.002	0.002
S73A003	UMUS*197	C6H6	LT	0.002	0.002
S73A003D	UMUS*219	C6H6	LT	0.002	0.002
S74A003	UMUS*212	C6H6	LT	0.002	0.002
S74A003D	UMUS*217	C6H6	LT	0.002	0.002
STAA020	UMUS*84	C6H6	LT	0.002	0.002
STAA020D	UMUS*220	C6H6	LT	0.002	0.002
STAA030	UMUS*125	C6H6	LT	0.002	0.002
STAA030D	UMUS*221	C6H6	LT	0.002	0.002
S73A001	UMUS*187	CCL3F	LT	0.006	0.006
S73A001D	UMUS*218	CCL3F	LT	0.006	0.006
S73A003	UMUS*197	CCL3F	LT	0.006	0.006
S73A003D	UMUS*219	CCL3F	LT	0.006	0.006
S74A003	UMUS*212	CCL3F		0.006	0.006
S74A003D	UMUS*217	CCL3F	LT	0.006	0.006
STAA020	UMUS*84	CCL3F		0.007	0.006
STAA020D	UMUS*220	CCL3F	LT	0.006	0.006
STAA030	UMUS*125	CCL3F	LT	0.006	0.006
STAA030D	UMUS*221	CCL3F	LT	0.006	0.006
S73A001	UMUS*187	CCL4	LT	0.007	0.007
S73A001D	UMUS*218	CCL4	LT	0.007	0.007
S73A003	UMUS*197	CCL4	LT	0.007	0.007
S73A003D	UMUS*219	CCL4	LT	0.007	0.007
S74A003	UMUS*212	CCL4	LT	0.007	0.007
S74A003D	UMUS*217	CCL4	LT	0.007	0.007
STAA020	UMUS*84	CCL4	LT	0.007	0.007
STAA020D	UMUS*220	CCL4	LT	0.007	0.007
STAA030	UMUS*125	CCL4	LT	0.007	0.007
STAA030D	UMUS*221	CCL4	LT	0.007	0.007
S73A001	UMUS*187	CH2CL2	LT	0.012	0.012
S73A001D	UMUS*218	CH2CL2	LT	0.012	0.012
S73A003	UMUS*197	CH2CL2	LT	0.012	0.012
S73A003D	UMUS*219	CH2CL2	LT	0.012	0.012
S74A003	UMUS*212	CH2CL2	LT	0.012	0.012
S74A003D	UMUS*217	CH2CL2	LT	0.012	0.012
STAA020	UMUS*84	CH2CL2	LT	0.012	0.012
STAA020D	UMUS*220	CH2CL2	LT	0.012	0.012
STAA030	UMUS*125	CH2CL2	LT	0.012	0.012
STAA030D	UMUS*221	CH2CL2	LT	0.012	0.012

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A001	UMUS*187	CH3BR	LT	0.006	0.006
S73A001D	UMUS*218	CH3BR	LT	0.006	0.006
S73A003	UMUS*197	CH3BR	LT	0.006	0.006
S73A003D	UMUS*219	CH3BR	LT	0.006	0.006
S74A003	UMUS*212	CH3BR	LT	0.006	0.006
S74A003D	UMUS*217	CH3BR	LT	0.006	0.006
STAA020	UMUS*84	CH3BR	LT	0.006	0.006
STAA020D	UMUS*220	CH3BR	LT	0.006	0.006
STAA030	UMUS*125	CH3BR	LT	0.006	0.006
STAA030D	UMUS*221	CH3BR	LT	0.006	0.006
S73A001	UMUS*187	CH3CL	LT	0.009	0.009
S73A001D	UMUS*218	CH3CL	LT	0.009	0.009
S73A003	UMUS*197	CH3CL	LT	0.009	0.009
S73A003D	UMUS*219	CH3CL	LT	0.009	0.009
S74A003	UMUS*212	CH3CL	LT	0.009	0.009
S74A003D	UMUS*217	CH3CL	LT	0.009	0.009
STAA020	UMUS*84	CH3CL	LT	0.009	0.009
STAA020D	UMUS*220	CH3CL	LT	0.009	0.009
STAA030	UMUS*125	CH3CL	LT	0.009	0.009
STAA030D	UMUS*221	CH3CL	LT	0.009	0.009
S73A001	UMUS*187	CHBR3	LT	0.007	0.007
S73A001D	UMUS*218	CHBR3	LT	0.007	0.007
S73A003	UMUS*197	CHBR3	LT	0.007	0.007
S73A003D	UMUS*219	CHBR3	LT	0.007	0.007
S74A003	UMUS*212	CHBR3	LT	0.007	0.007
S74A003D	UMUS*217	CHBR3	LT	0.007	0.007
STAA020	UMUS*84	CHBR3	LT	0.007	0.007
STAA020D	UMUS*220	CHBR3	LT	0.007	0.007
STAA030	UMUS*125	CHBR3	LT	0.007	0.007
STAA030D	UMUS*221	CHBR3	LT	0.007	0.007
S73A001	UMUS*187	CHCL3	LT	0.001	0.001
S73A001D	UMUS*218	CHCL3	LT	0.001	0.001
S73A003	UMUS*197	CHCL3	LT	0.001	0.001
S73A003D	UMUS*219	CHCL3	LT	0.001	0.001
S74A003	UMUS*212	CHCL3	LT	0.001	0.001
S74A003D	UMUS*217	CHCL3	LT	0.001	0.001
STAA020	UMUS*84	CHCL3	LT	0.001	0.001
STAA020D	UMUS*220	CHCL3	LT	0.001	0.001
STAA030	UMUS*125	CHCL3	LT	0.001	0.001
STAA030D	UMUS*221	CHCL3	LT	0.001	0.001
S73A001	UMUS*187	CL2BZ	ND	0.100	0.000
S73A001D	UMUS*218	CL2BZ	ND	0.100	0.000
S73A003	UMUS*197	CL2BZ	ND	0.100	0.000
S73A003D	UMUS*219	CL2BZ	ND	0.100	0.000
S74A003	UMUS*212	CL2BZ	ND	0.100	0.000
S74A003D	UMUS*217	CL2BZ	ND	0.100	0.000
STAA020	UMUS*84	CL2BZ	ND	0.100	0.000
STAA020D	UMUS*220	CL2BZ	ND	0.100	0.000
STAA030	UMUS*125	CL2BZ	ND	0.100	0.000
STAA030D	UMUS*221	CL2BZ	ND	0.100	0.000
S73A001	UMUS*187	CLC6H5	LT	0.001	0.001
S73A001D	UMUS*218	CLC6H5	LT	0.001	0.001

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S73A003	UMUS*197	CLC6H5	LT	0.001	0.001
S73A003D	UMUS*219	CLC6H5	LT	0.001	0.001
S74A003	UMUS*212	CLC6H5	LT	0.001	0.001
S74A003D	UMUS*217	CLC6H5	LT	0.001	0.001
STAA020	UMUS*84	CLC6H5	LT	0.001	0.001
STAA020D	UMUS*220	CLC6H5	LT	0.001	0.001
STAA030	UMUS*125	CLC6H5	LT	0.001	0.001
STAA030D	UMUS*221	CLC6H5	LT	0.001	0.001
S73A001	UMUS*187	CS2	LT	0.004	0.004
S73A001D	UMUS*218	CS2	LT	0.004	0.004
S73A003	UMUS*197	CS2	LT	0.004	0.004
S73A003D	UMUS*219	CS2	LT	0.004	0.004
S74A003	UMUS*212	CS2	LT	0.004	0.004
S74A003D	UMUS*217	CS2	LT	0.004	0.004
STAA020	UMUS*84	CS2	LT	0.004	0.004
STAA020D	UMUS*220	CS2	LT	0.004	0.004
STAA030	UMUS*125	CS2	LT	0.004	0.004
STAA030D	UMUS*221	CS2	LT	0.004	0.004
S73A001	UMUS*187	DBRCLM	LT	0.003	0.003
S73A001D	UMUS*218	DBRCLM	LT	0.003	0.003
S73A003	UMUS*197	DBRCLM	LT	0.003	0.003
S73A003D	UMUS*219	DBRCLM	LT	0.003	0.003
S74A003	UMUS*212	DBRCLM	LT	0.003	0.003
S74A003D	UMUS*217	DBRCLM	LT	0.003	0.003
STAA020	UMUS*84	DBRCLM	LT	0.003	0.003
STAA020D	UMUS*220	DBRCLM	LT	0.003	0.003
STAA030	UMUS*125	DBRCLM	LT	0.003	0.003
STAA030D	UMUS*221	DBRCLM	LT	0.003	0.003
S73A001	UMUS*187	ETC6H5	LT	0.002	0.002
S73A001D	UMUS*218	ETC6H5	LT	0.002	0.002
S73A003	UMUS*197	ETC6H5	LT	0.002	0.002
S73A003D	UMUS*219	ETC6H5	LT	0.002	0.002
S74A003	UMUS*212	ETC6H5	LT	0.002	0.002
S74A003D	UMUS*217	ETC6H5	LT	0.002	0.002
STAA020	UMUS*84	ETC6H5	LT	0.002	0.002
STAA020D	UMUS*220	ETC6H5	LT	0.002	0.002
STAA030	UMUS*125	ETC6H5	LT	0.002	0.002
STAA030D	UMUS*221	ETC6H5	LT	0.002	0.002
S73A001	UMUS*187	MEC6H5	LT	0.001	0.001
S73A001D	UMUS*218	MEC6H5	LT	0.001	0.001
S73A003	UMUS*197	MEC6H5	LT	0.001	0.001
S73A003D	UMUS*219	MEC6H5	LT	0.001	0.001
S74A003	UMUS*212	MEC6H5	LT	0.001	0.001
S74A003D	UMUS*217	MEC6H5	LT	0.001	0.001
STAA020	UMUS*84	MEC6H5	LT	0.001	0.001
STAA020D	UMUS*220	MEC6H5	LT	0.001	0.001
STAA030	UMUS*125	MEC6H5	LT	0.001	0.001
STAA030D	UMUS*221	MEC6H5	LT	0.001	0.001
S73A001	UMUS*187	MEK	LT	0.070	0.070
S73A001D	UMUS*218	MEK	LT	0.070	0.070
S73A003	UMUS*197	MEK	LT	0.070	0.070
S73A003D	UMUS*219	MEK	LT	0.070	0.070

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
S74A003	UMUS*212	MEK	LT	0.070	0.070
S74A003D	UMUS*217	MEK	LT	0.070	0.070
STAA020	UMUS*84	MEK	LT	0.070	0.070
STAA020D	UMUS*220	MEK	LT	0.070	0.070
STAA030	UMUS*125	MEK	LT	0.070	0.070
STAA030D	UMUS*221	MEK	LT	0.070	0.070
S73A001	UMUS*187	MIBK	LT	0.027	0.027
S73A001D	UMUS*218	MIBK	LT	0.027	0.027
S73A003	UMUS*197	MIBK	LT	0.027	0.027
S73A003D	UMUS*219	MIBK	LT	0.027	0.027
S74A003	UMUS*212	MIBK	LT	0.027	0.027
S74A003D	UMUS*217	MIBK	LT	0.027	0.027
STAA020	UMUS*84	MIBK	LT	0.027	0.027
STAA020D	UMUS*220	MIBK	LT	0.027	0.027
STAA030	UMUS*125	MIBK	LT	0.027	0.027
STAA030D	UMUS*221	MIBK	LT	0.027	0.027
S73A001	UMUS*187	MNBK	LT	0.032	0.032
S73A001D	UMUS*218	MNBK	LT	0.032	0.032
S73A003	UMUS*197	MNBK	LT	0.032	0.032
S73A003D	UMUS*219	MNBK	LT	0.032	0.032
S74A003	UMUS*212	MNBK	LT	0.032	0.032
S74A003D	UMUS*217	MNBK	LT	0.032	0.032
STAA020	UMUS*84	MNBK	LT	0.032	0.032
STAA020D	UMUS*220	MNBK	LT	0.032	0.032
STAA030	UMUS*125	MNBK	LT	0.032	0.032
STAA030D	UMUS*221	MNBK	LT	0.032	0.032
S73A001	UMUS*187	STYR	LT	0.003	0.003
S73A001D	UMUS*218	STYR	LT	0.003	0.003
S73A003	UMUS*197	STYR	LT	0.003	0.003
S73A003D	UMUS*219	STYR	LT	0.003	0.003
S74A003	UMUS*212	STYR	LT	0.003	0.003
S74A003D	UMUS*217	STYR	LT	0.003	0.003
STAA020	UMUS*84	STYR	LT	0.003	0.003
STAA020D	UMUS*220	STYR	LT	0.003	0.003
STAA030	UMUS*125	STYR	LT	0.003	0.003
STAA030D	UMUS*221	STYR	LT	0.003	0.003
S73A001	UMUS*187	T13DCP	LT	0.003	0.003
S73A001D	UMUS*218	T13DCP	LT	0.003	0.003
S73A003	UMUS*197	T13DCP	LT	0.003	0.003
S73A003D	UMUS*219	T13DCP	LT	0.003	0.003
S74A003	UMUS*212	T13DCP	LT	0.003	0.003
S74A003D	UMUS*217	T13DCP	LT	0.003	0.003
STAA020	UMUS*84	T13DCP	LT	0.003	0.003
STAA020D	UMUS*220	T13DCP	LT	0.003	0.003
STAA030	UMUS*125	T13DCP	LT	0.003	0.003
STAA030D	UMUS*221	T13DCP	LT	0.003	0.003
S73A001	UMUS*187	TCLEA	LT	0.002	0.002
S73A001D	UMUS*218	TCLEA	LT	0.002	0.002
S73A003	UMUS*197	TCLEA	LT	0.002	0.002
S73A003D	UMUS*219	TCLEA	LT	0.002	0.002
S74A003	UMUS*212	TCLEA	LT	0.002	0.002
S74A003D	UMUS*217	TCLEA	LT	0.002	0.002

SITE ID	FIELD ID	ANALYTE ABBREVIATION		RESULT	CRL
STAA020	UMUS*84	TCLEA	LT	0.002	0.002
STAA020D	UMUS*220	TCLEA	LT	0.002	0.002
STAA030	UMUS*125	TCLEA	LT	0.002	0.002
STAA030D	UMUS*221	TCLEA	LT	0.002	0.002
S73A001	UMUS*187	TCLEE	LT	0.001	0.001
S73A001D	UMUS*218	TCLEE	LT	0.001	0.001
S73A003	UMUS*197	TCLEE	LT	0.001	0.001
S73A003D	UMUS*219	TCLEE	LT	0.001	0.001
S74A003	UMUS*212	TCLEE	LT	0.001	0.001
S74A003D	UMUS*217	TCLEE	LT	0.001	0.001
STAA020	UMUS*84	TCLEE	LT	0.001	0.001
STAA020D	UMUS*220	TCLEE	LT	0.001	0.001
STAA030	UMUS*125	TCLEE	LT	0.001	0.001
STAA030D	UMUS*221	TCLEE	LT	0.001	0.001
S73A001	UMUS*187	TRCLE	LT	0.003	0.003
S73A001D	UMUS*218	TRCLE	LT	0.003	0.003
S73A003	UMUS*197	TRCLE	LT	0.003	0.003
S73A003D	UMUS*219	TRCLE	LT	0.003	0.003
S74A003	UMUS*212	TRCLE	LT	0.003	0.003
S74A003D	UMUS*217	TRCLE	LT	0.003	0.003
STAA020	UMUS*84	TRCLE	LT	0.003	0.003
STAA020D	UMUS*220	TRCLE	LT	0.003	0.003
STAA030	UMUS*125	TRCLE	LT	0.003	0.003
STAA030D	UMUS*221	TRCLE	LT	0.003	0.003
STAA020D	UMUS*220	UNK167		0.007	0.000
S73A001	UMUS*187	XYLEN	LT	0.002	0.002
S73A001D	UMUS*218	XYLEN	LT	0.002	0.002
S73A003	UMUS*197	XYLEN	LT	0.002	0.002
S73A003D	UMUS*219	XYLEN	LT	0.002	0.002
S74A003	UMUS*212	XYLEN	LT	0.002	0.002
S74A003D	UMUS*217	XYLEN	LT	0.002	0.002
STAA020	UMUS*84	XYLEN	LT	0.002	0.002
STAA020D	UMUS*220	XYLEN	LT	0.002	0.002
STAA030	UMUS*125	XYLEN	LT	0.002	0.002
STAA030D	UMUS*221	XYLEN	LT	0.002	0.002

G.7

Trip, Rinse, and Method Blank Positive Results

TRIP BLANK POSITIVE RESULTS

(No positive results were obtained for trip blanks.)

RINSE BLANK POSITIVE RESULTS

ANALABBR	ANLTNAME	UNIT MEAS	CORR MEAS
2E1HXL	2-ETHYHEXANOL	UGL	10.000
CHCL3	CHLOROFORM	UGL	1.400
CHCL3	CHLOROFORM	UGL	1.600
CHCL3	CHLOROFORM	UGL	1.600
CHCL3	CHLOROFORM	UGL	1.700
CHCL3	CHLOROFORM	UGL	1.900
CHCL3	CHLOROFORM	UGL	3.100
DOAD	DIOCTYL ADIPATE	UGL	5.000
UNK637	Unknown Compound #637	UGL	8.000
UNK649	Unknown Compound #649	UGL	5.000
UNK657	Unknown Compound #637	UGL	5.000

METHOD BLANK POSITIVE RESULTS

ANALABBR	ANLTNAME	UNIT MEAS	CORR MEAS
CCL3F	TRICHLOROFLUOROMETHANE	UGG	0.007
CCL3F	TRICHLOROFLUOROMETHANE	UGG	0.008
DNBP	DI-N-BUTYL PHTHALATE	UGG	0.290
DNBP	DI-N-BUTYL PHTHALATE	UGG	0.040
DNBP	DI-N-BUTYL PHTHALATE	UGG	0.420
DOAD	DIOCTYL ADIPATE	UGG	0.300

APPENDIX H

Flagging Codes
USAEC IRDMIS

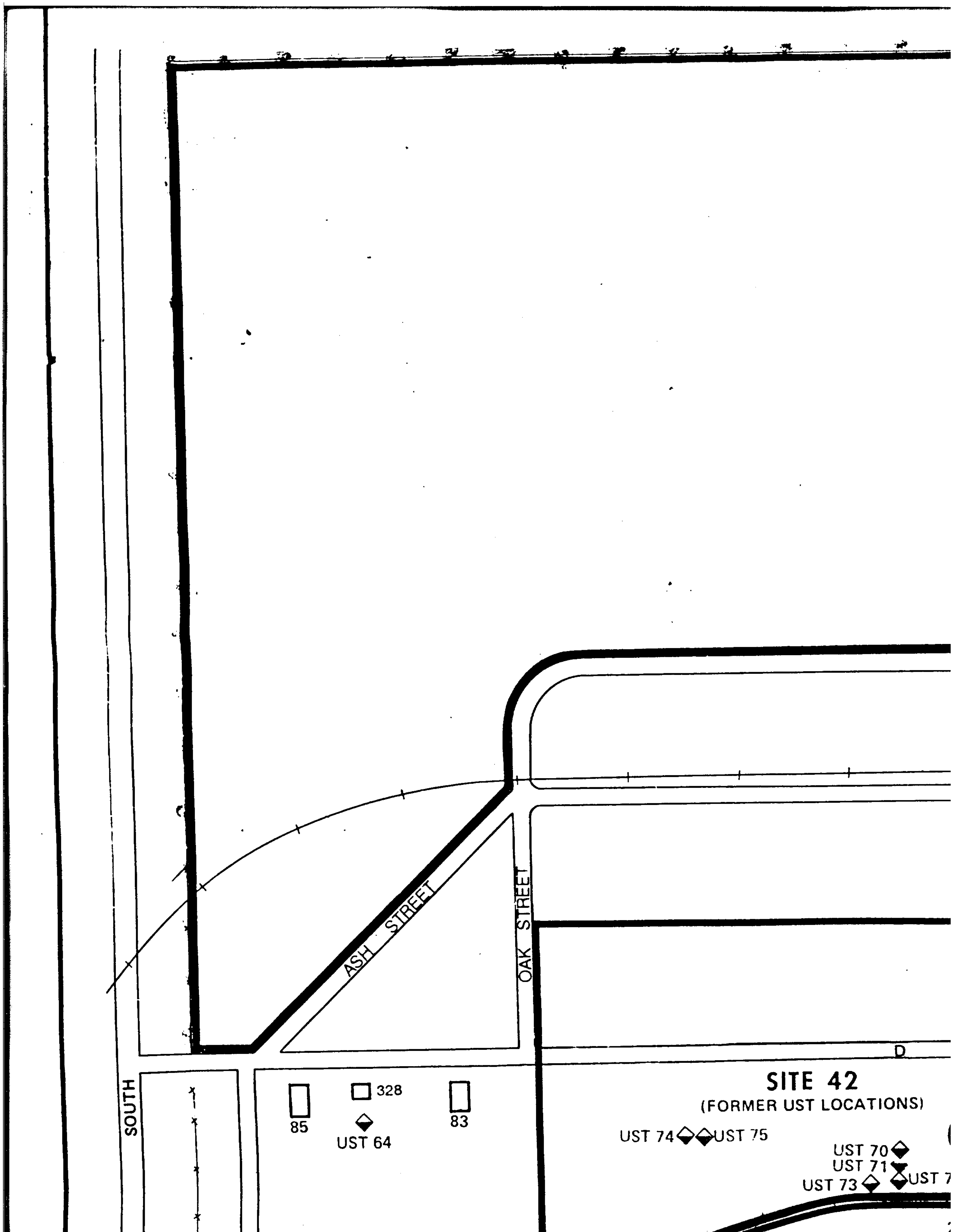
APPENDIX H
Flagging Codes, USAEC IRDMIS

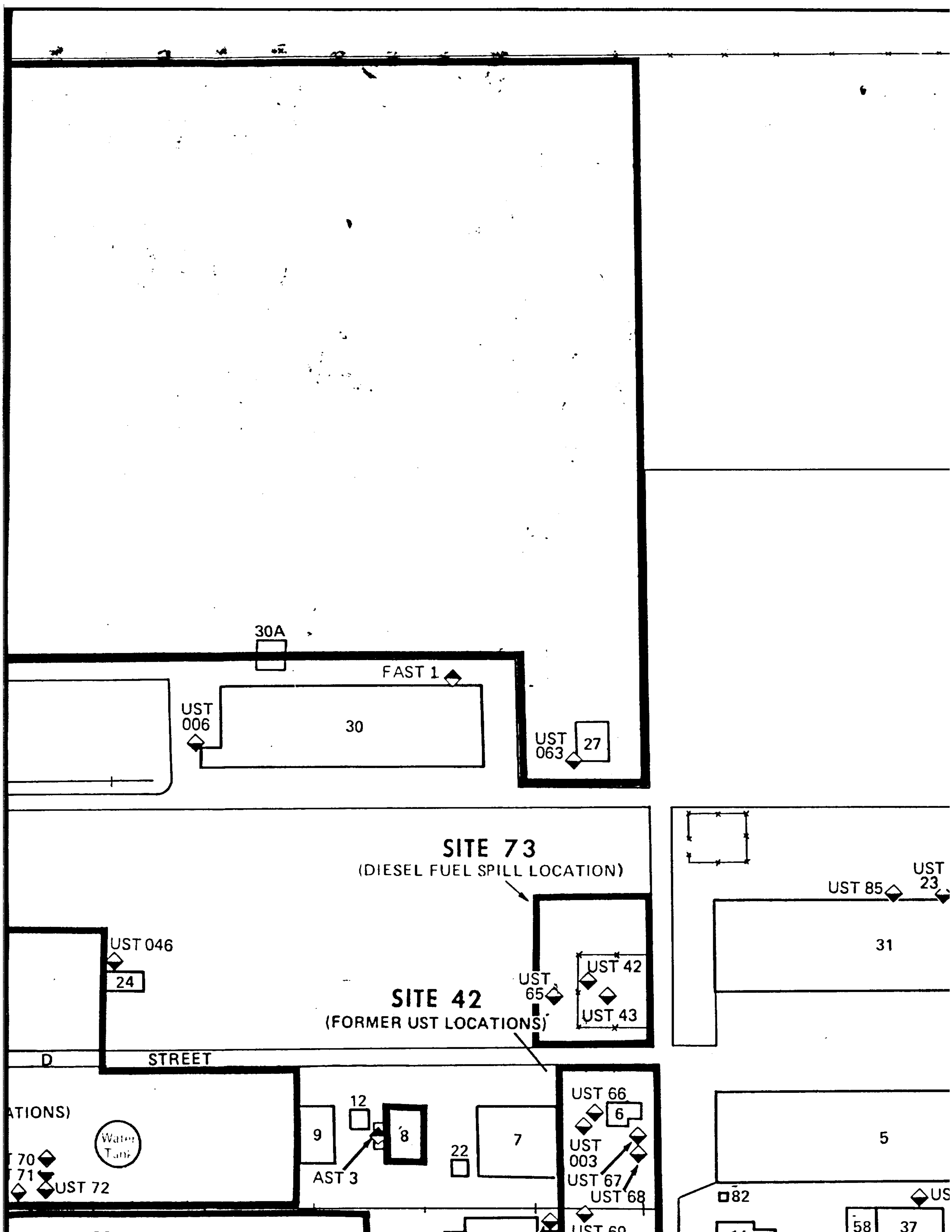
Flagging Code	Explanation
A	Analyte found in trip blank as well as in field samples. The analyte was detected in the field sample and the trip blank for the same cooler. To be used for volatiles only.
B	Analyte found in the method blank or QC blank as well as the sample. This code is to be used when an analyte has been detected and quantitated at higher-than-normal background levels. For metals in soil, the following rules must be followed: (1) If the analyte is detected in the method blank, both the field and QC samples are to be flagged. (2) If the analyte is detected in the QC blank, only the QC samples are to be flagged.
C	Analysis was confirmed. This code is to be used when a confirmatory analysis bears out the reported result (if it is above the CRL or MDL). The confirmatory analysis must use a different column or analytical technique.
D	Duplicate analysis. This code is used to distinguish analytical results when duplicate analyses are required. Flag only the second (duplicate) sample.
E	No longer in use.
F	Sample filtered prior to analysis. This code is to be used when results of filtered samples are to be differentiated from non-filtered samples. This code is also to be used when filtering of samples (as a first step in sample preparation) is a deviation from the approved method SOP. This code may be used to indicate both field and laboratory filtering. It is not to be used when filtering the extract is the normal procedure.
G	Analyte found in rinse blank as well as field sample. The analyte was detected in the field sample as well as that day's rinse blank for the same equipment type.

Flagging Code	Explanation
H	Out of control, but data accepted due to high recoveries. This code is to be used when control analytes show higher-than-normal recoveries, assuring USAEC that if a concentration was found in the sample at or near the CRL, it would have been reported.
I	Interferences in the sample cause the quantitation or identification to be suspect. This code is to be used when matrix interferences may mask detection of the target analyte. Must always be used with code J.
J	Value is estimated either due to interferences in the sample (use codes J and I) or because the value is below the MDL but above the instrumental detection level (use codes J and P). This code must always be used with codes I or P. The J and I combination may be used both for methods demonstrated under the 1990 QA program and for methods validated under the 1993 QA guidelines. The J and P combination is to be used only for methods validated under the 1993 QA guidelines.
K	Reported results affected by interferences or high background. This code is to be used when analyte levels at or near the CRL or MDL cannot be accurately quantified down to the CRL/MDL due to interferences. This code will allow a laboratory to input a higher CRL/MDL, rather than defaulting to the methods data base.
L	Out of control, data rejected due to low recoveries. This code is to be used when recoveries of the control analytes are depressed, so that there is no assurance that values at or near the CRL are accurate.
M	Duplicate (high) spike analysis not within control limits. This code is to be used when one of the duplicate spikes gives significantly different results, placing the spike average outside of control limits.
N	Tentatively identified compound (result of a GC/MS library search) with a match greater than 70 percent. To be used when specified in the contract/task order.
O	No longer in use.

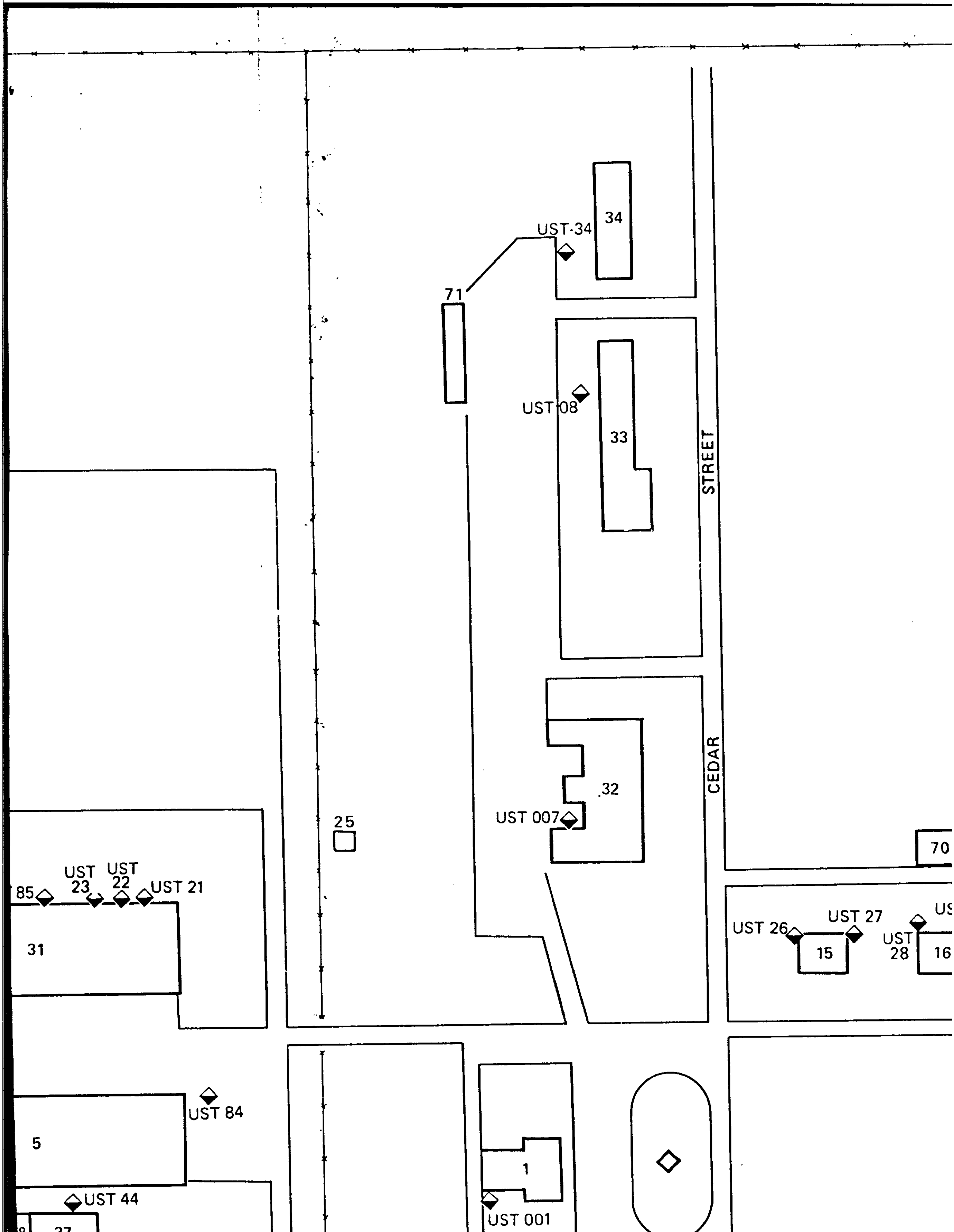
Flagging Code	Explanation
P	Value is less than the method reporting level, but greater than the instrumental detection limit. This code must always be used with J. This code is only to be used for methods validated under the 1993 QA guidelines.
Q	Confirmatory analysis was performed; however, sample interference obscured the area where the peak of interest would have appeared. To be used when the peak of interest falls within the retention-time window on the primary column, but the retention-time window on the secondary column is masked by interferences.
R	Nontarget compound analyzed for but not detected (must be used with a Boolean of ND). This code is used only for those analytes (in GC/MS methods) that were not performance demonstrated or validated. To be used when specified in the contract/task order.
S	Nontarget compound analyzed for and detected. This code is used only for those analytes (in GC/MS methods) that were not performance demonstrated or validated. Also used to report tentatively identified compounds that are quantitated against an internal standard. To be used when specified in the contract/task order.
T	Nontarget compound analyzed for but not detected (must be used with a Boolean of ND). This code is used only for those analytes (in non-GC/MS methods) that were not performance demonstrated or validated.
U	Analysis is unconfirmed. This code is to be used when a confirmatory analysis has been performed, but does not verify the analytical results from the initial analysis.
V	Sample was subjected to unusual storage/preservation conditions. To be used when samples are received at the laboratory at greater than 4°C, or for those that were not correctly preserved in the field.

Flagging Code	Explanation
W	Single analyte required from a multi-analyte method. This code is to be used when field samples are to be analyzed for a subset of the demonstrated/validated analytes.
X	Analyte recovery outside of certified range but within acceptable limits. This code is to be used when analyte recoveries exceed the upper limit of the certified range by less than 15 percent, and the laboratory feels that a dilution is not warranted.
Y	Tentatively identified compound (results of a GC/MS library search) with a match of less than 70 percent, but with a peak area greater than 35 percent of the internal standard. To be used when specified in the contract/task order.
Z	Nontarget compound analyzed for and detected. This code is used only for those analytes (in non-GC/MS methods) that were not performance demonstrated or validated.
1	Result less than the CRL but greater than the Criteria of Detection (COD). Can be used only for methods that were performance demonstrated under the 1990 QA program.
2	Ending calibration not within acceptable limits. This code is to be used for an analyte for which the ending calibration is still unacceptable after multiple attempts.
3	Internal standard(s) not within acceptable limits.
7	Low spike recovery is not within control limits. This code is to be used when the low spike recovery (not the three-day average) falls outside of control limits and the analytical data are potentially biased.

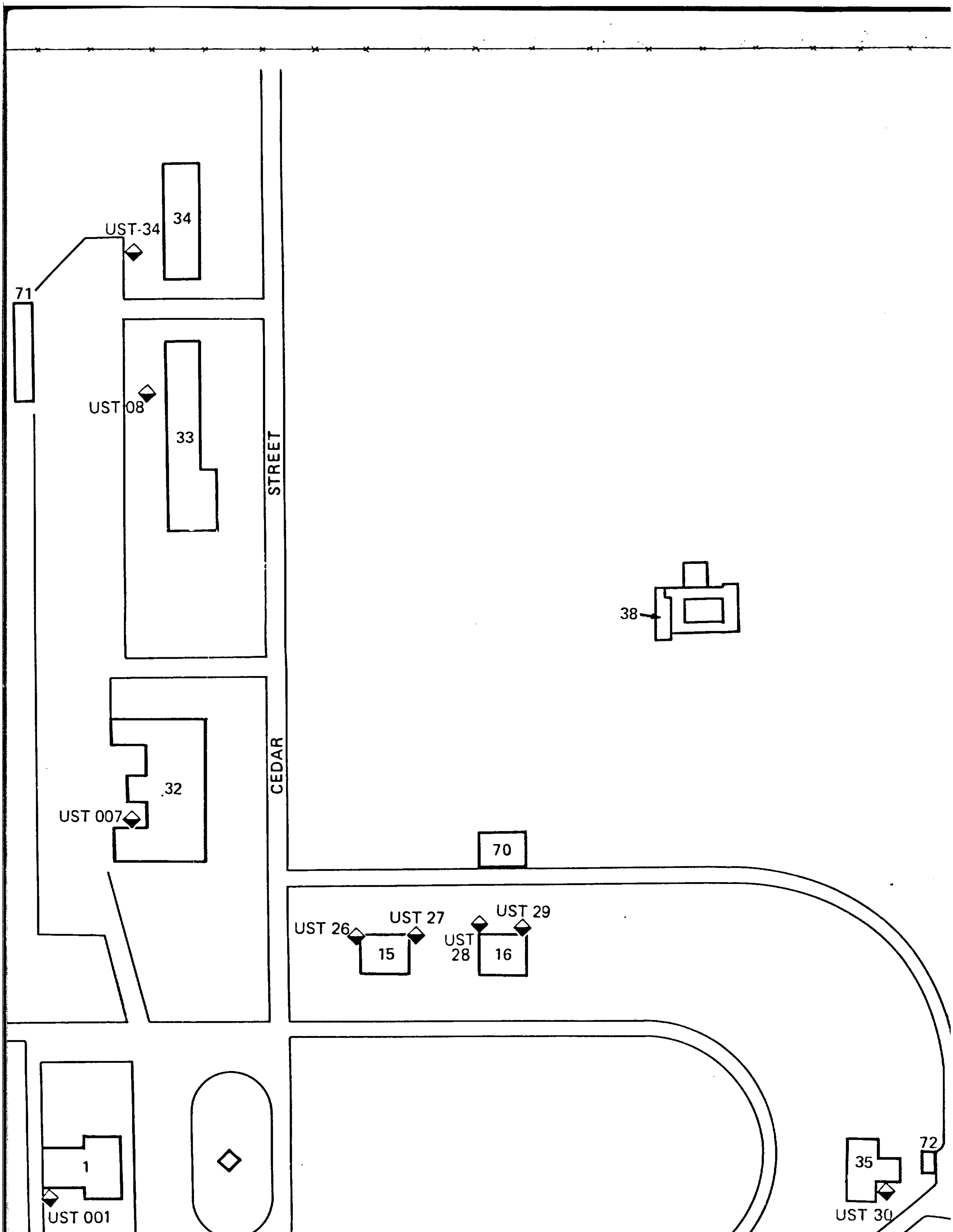

SITE 42
(FORMER UST LOCATIONS)
ASH STREET
OAK STREET
SOUTH
D
85
328
83
UST 64
UST 74
UST 75
UST 70
UST 71
UST 73



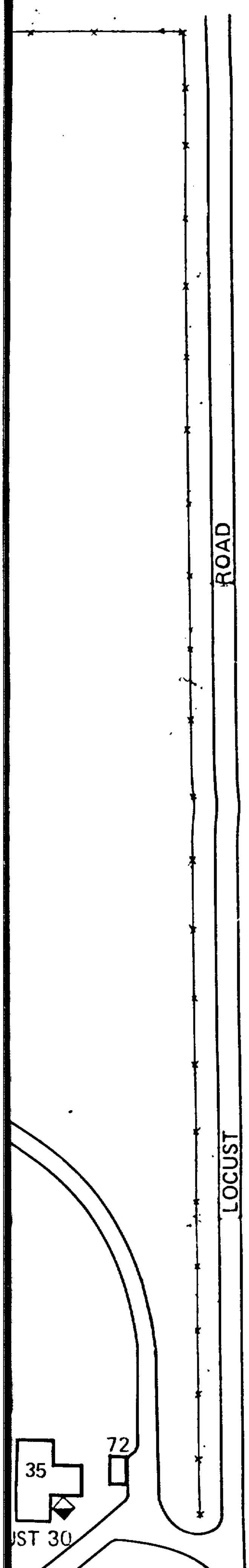
30A
FAST 1
UST 006
30
UST 063
27
SITE 73
(DIESEL FUEL SPILL LOCATION)
UST 85
UST 23
31
UST 046
24
UST 42
UST 65
UST 43
SITE 42
(FORMER UST LOCATIONS)
D STREET
UST 66
6
12
9
8
22
7
5
UST 003
UST 67
UST 68
AST 3
Water Tank
UST 72
82
58
37

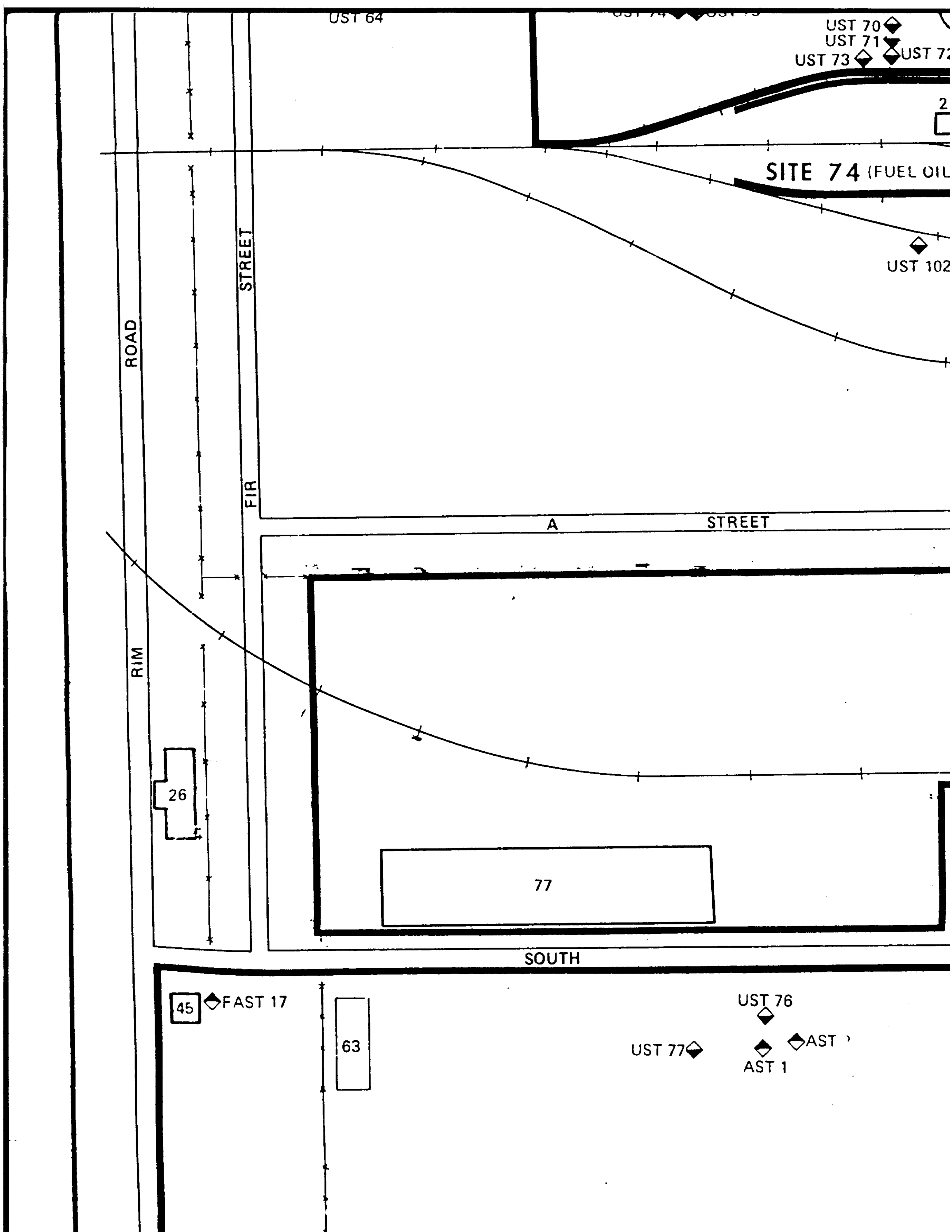


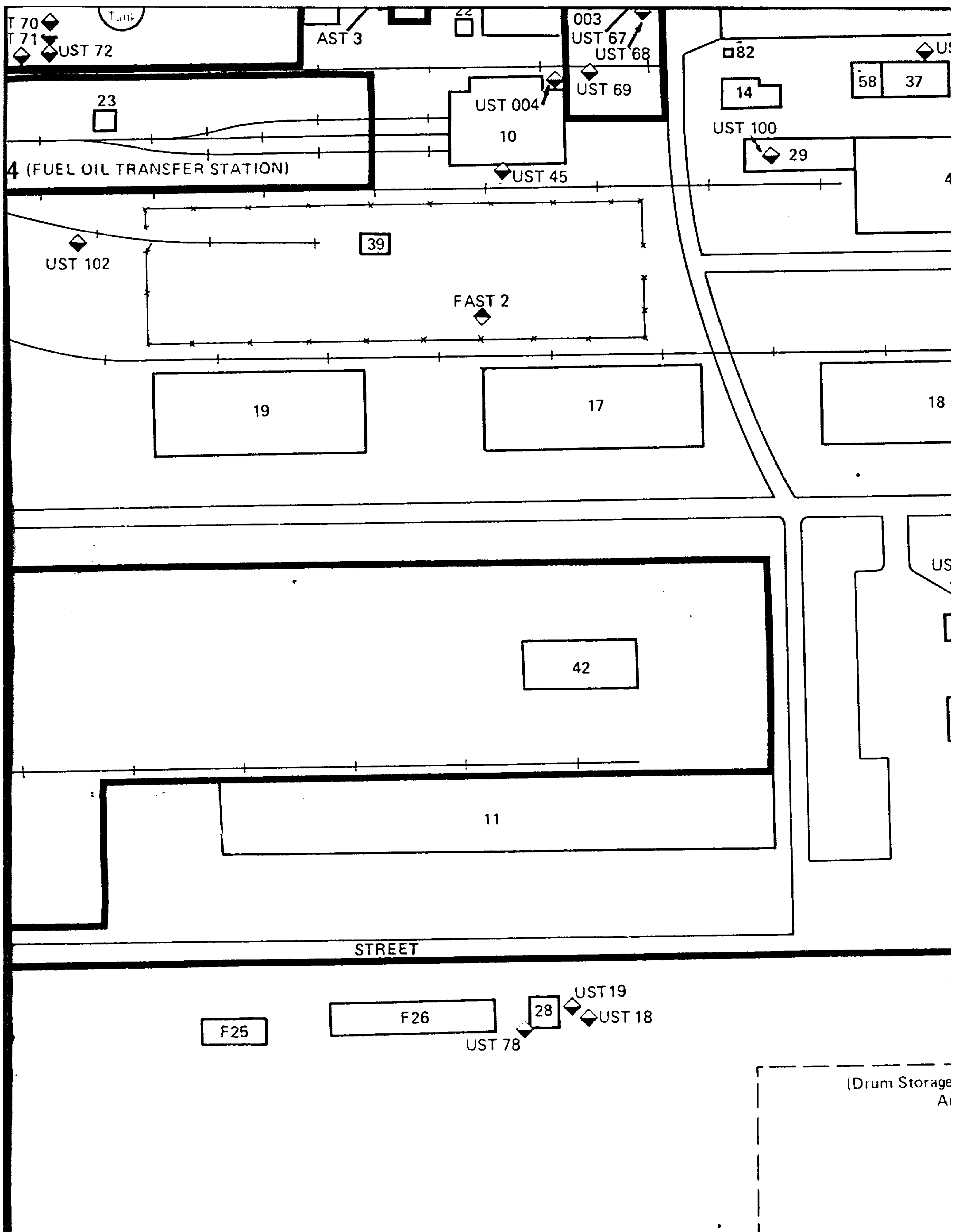
34
UST-34
71
UST 08
33
STREET
CEDAR
32
UST 007
25
70
85
UST 23
UST 22
UST 21
31
UST 26
UST 27
15
UST 28
16
UST 84
5
1
UST 44
UST 001
37

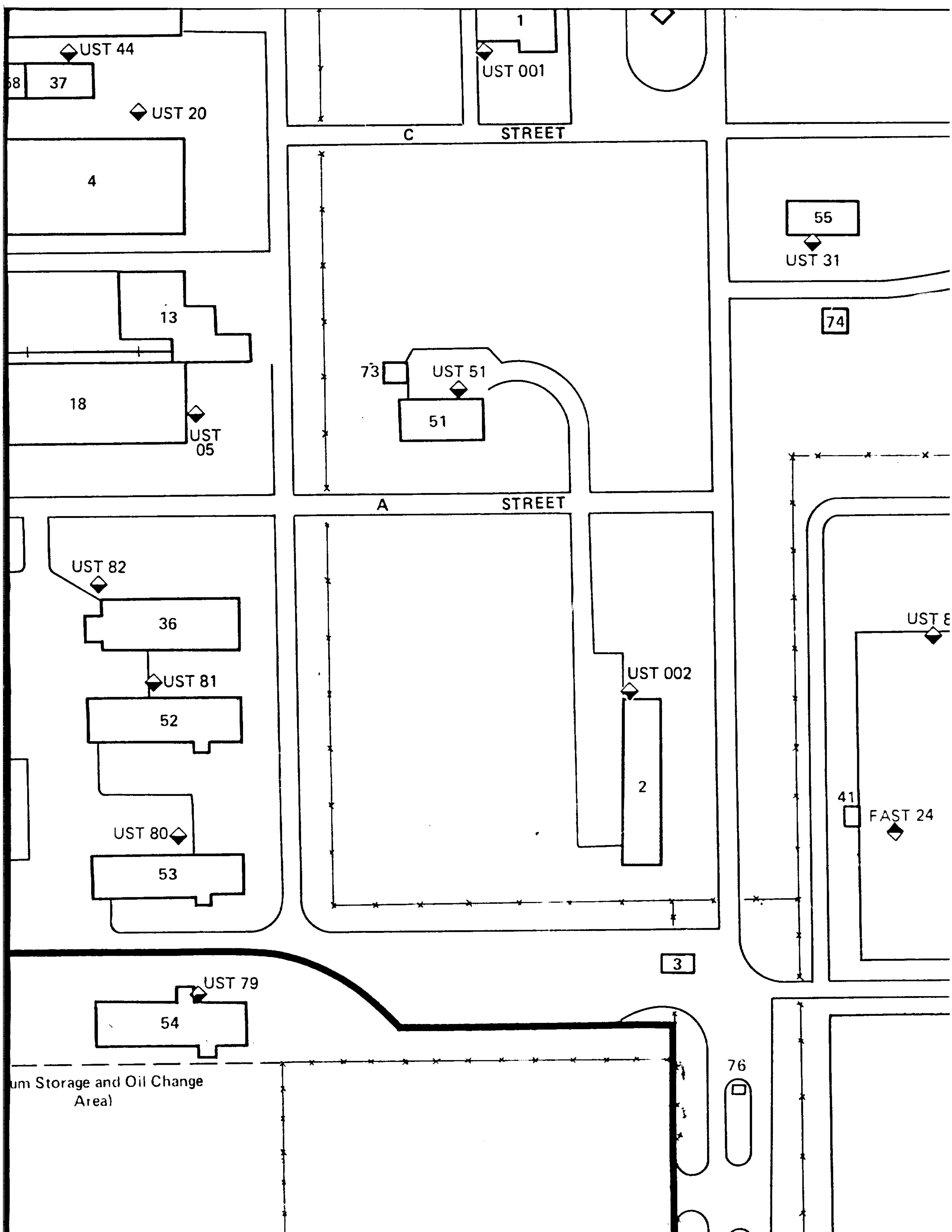


34
UST-34
71
UST 08
33
STREET
38
CEDAR
32
UST 007
70
UST 26
UST 27
UST 29
15
UST
28
16
1
UST 001
35
72
UST 30

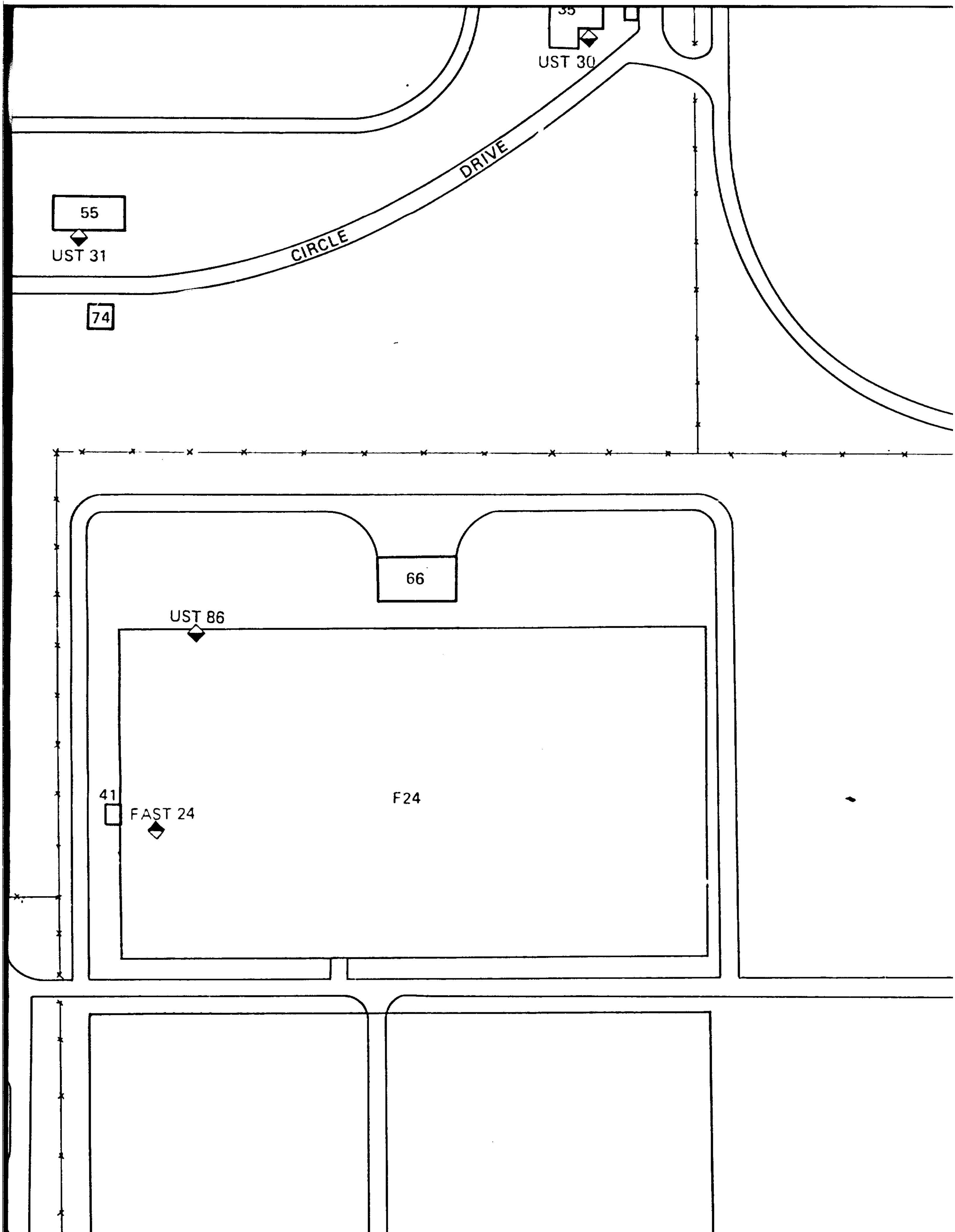

LOCUST ROAD
72
35
UST 30


UST 64
UST 70
UST 71
UST 72
UST 73
SITE 74 (FUEL OIL
UST 102
ROAD
RIM
FIR STREET
A STREET
SOUTH
26
77
45
FAST 17
63
UST 76
UST 77
AST 1

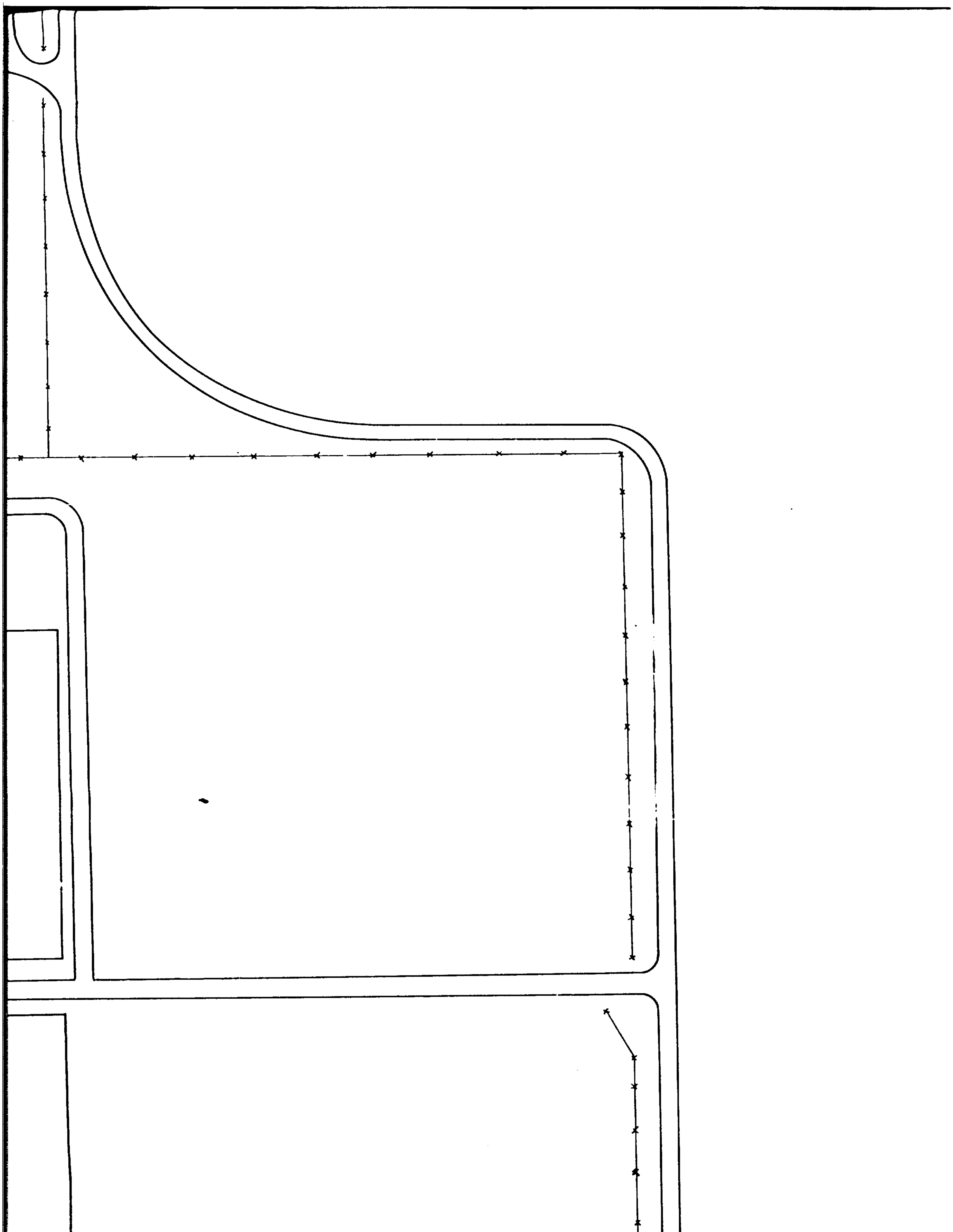

T 70
T 71
UST 72
AST 3
22
003
UST 67
UST 68
UST 69
UST 004
10
23
4 (FUEL OIL TRANSFER STATION)
UST 45
82
14
58
37
UST 100
29
39
UST 102
FAST 2
19
17
18
42
11
STREET
UST 19
28
UST 18
F25
F26
UST 78
(Drum Storage

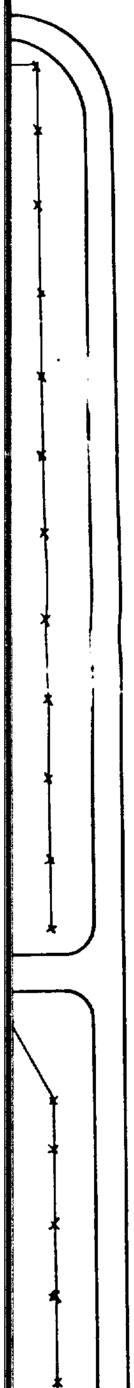


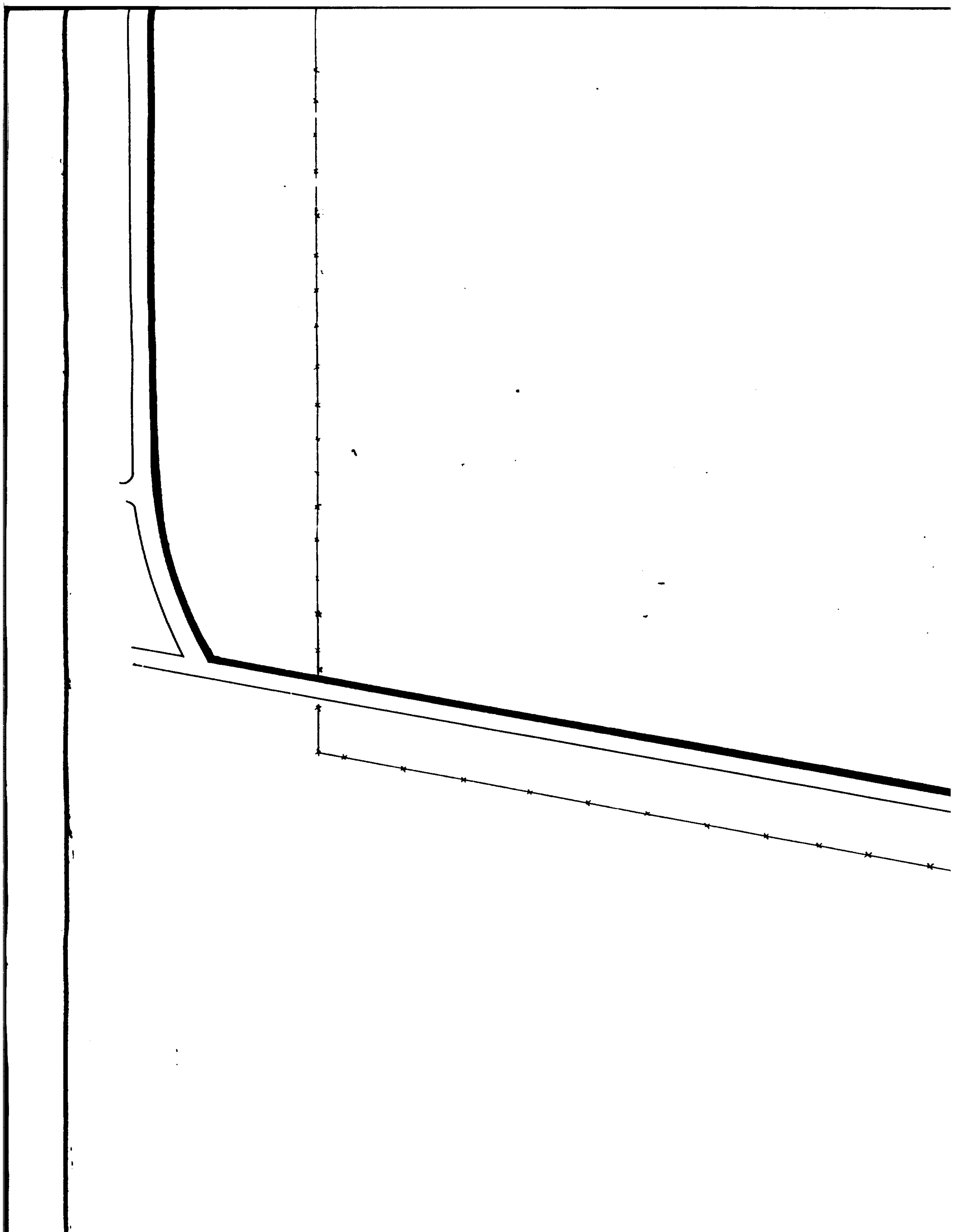
1
UST 001
UST 44
37
UST 20
C
STREET
4
55
UST 31
74
13
73
UST 51
51
18
UST
05
A
STREET
UST 82
36
UST 81
52
UST 002
2
UST 80
53
41
FAST 24
3
UST 79
54
76
um Storage and Oil Change
Area)

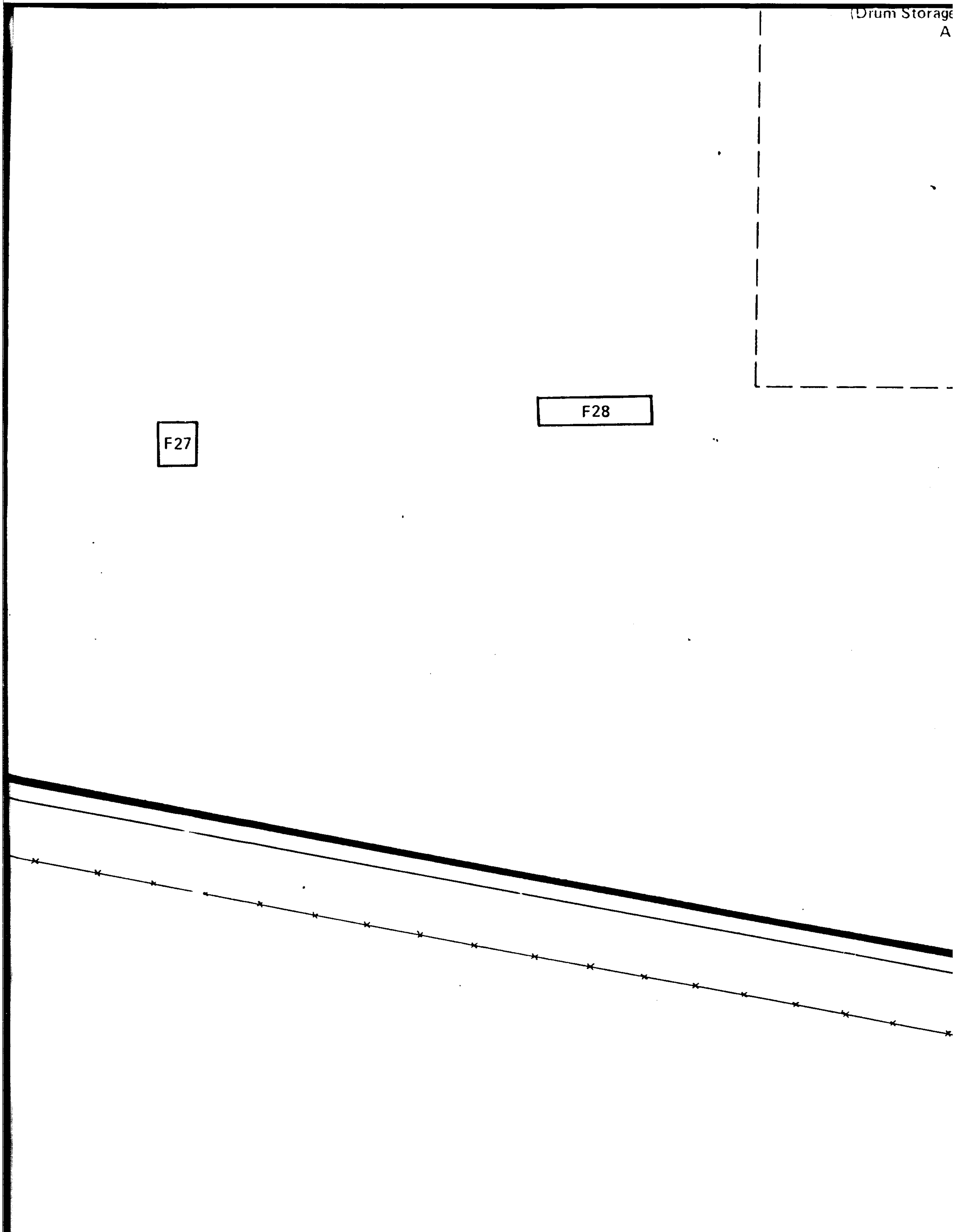


35
UST 30
55
UST 31
CIRCLE
DRIVE
74
66
UST 86
41
FAST 24
F24

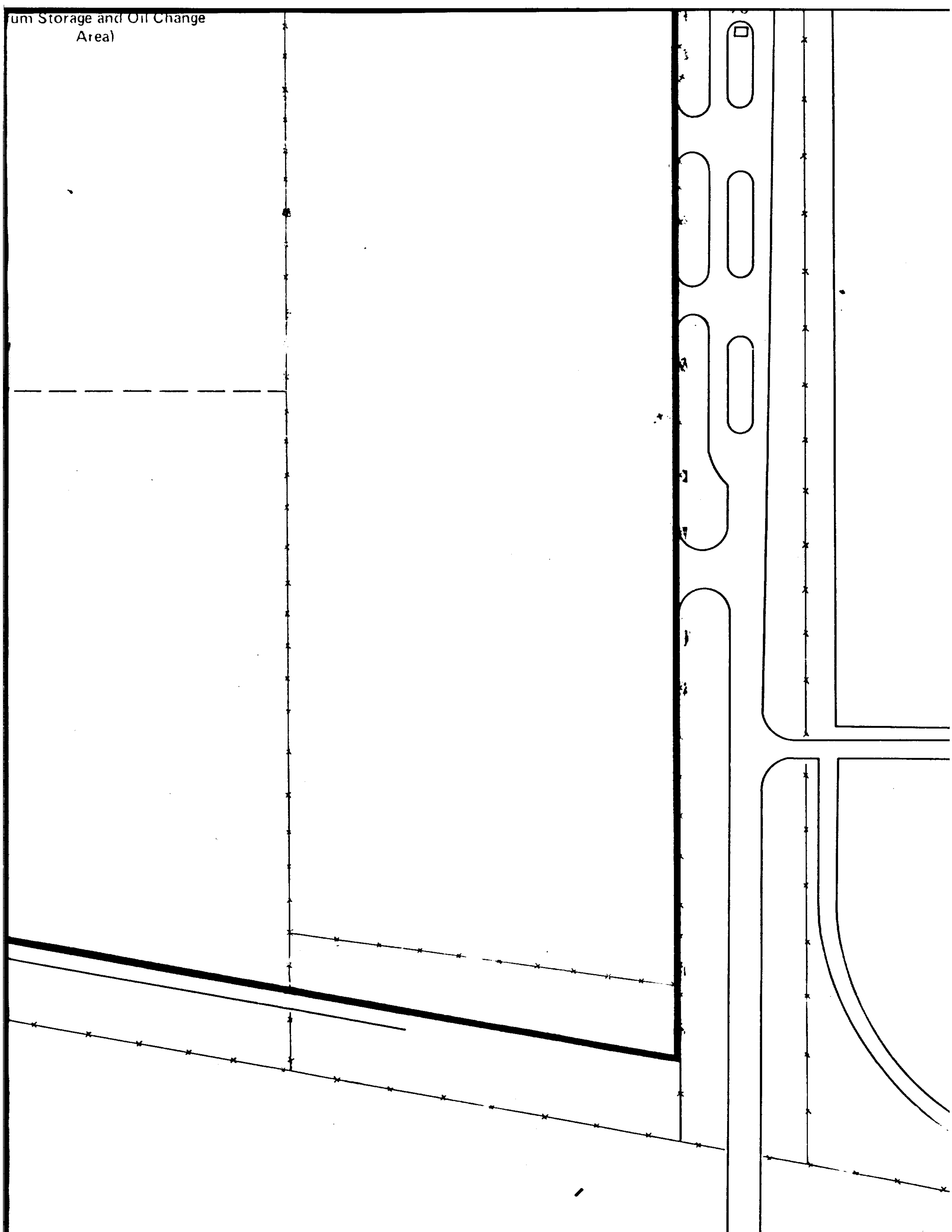


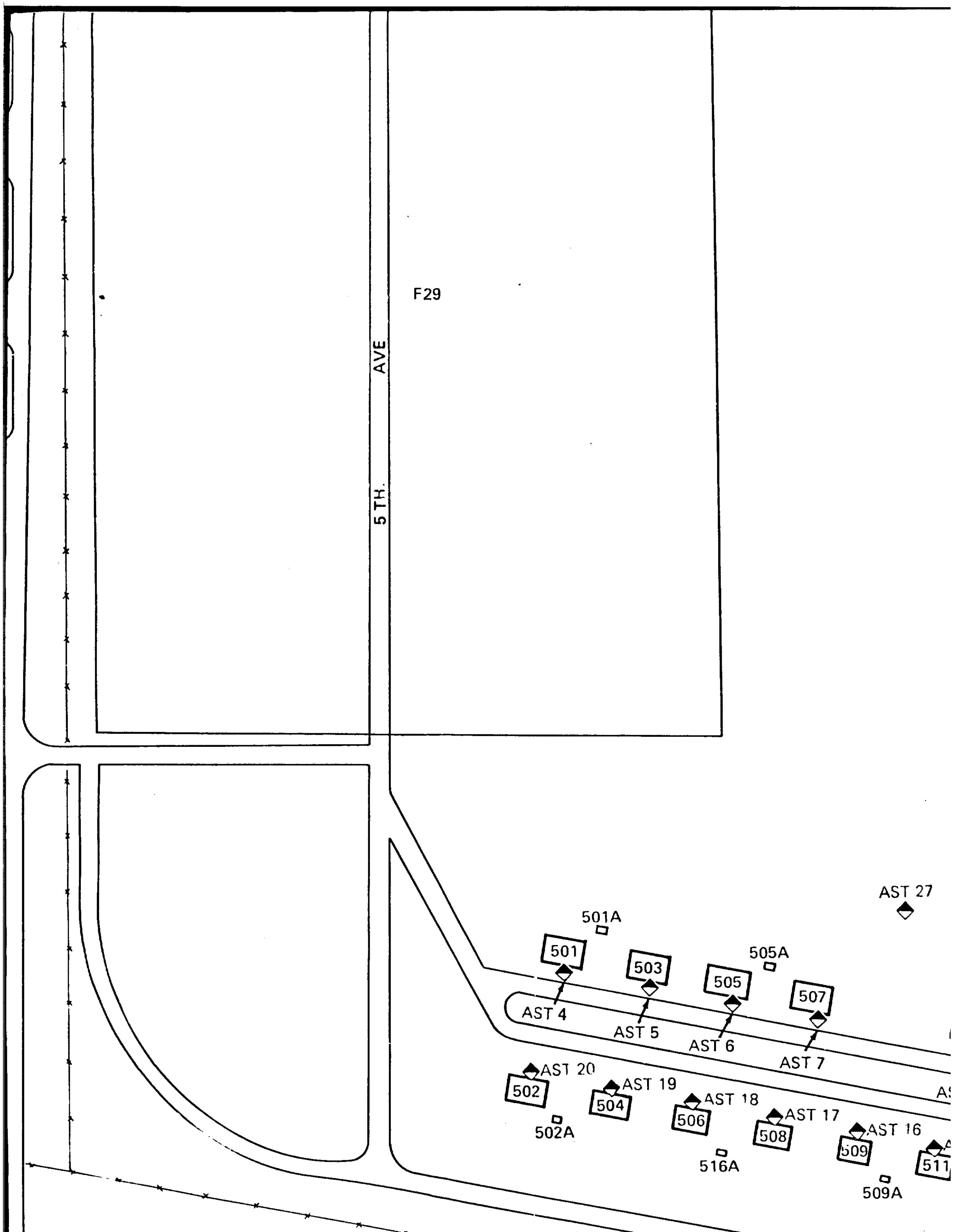




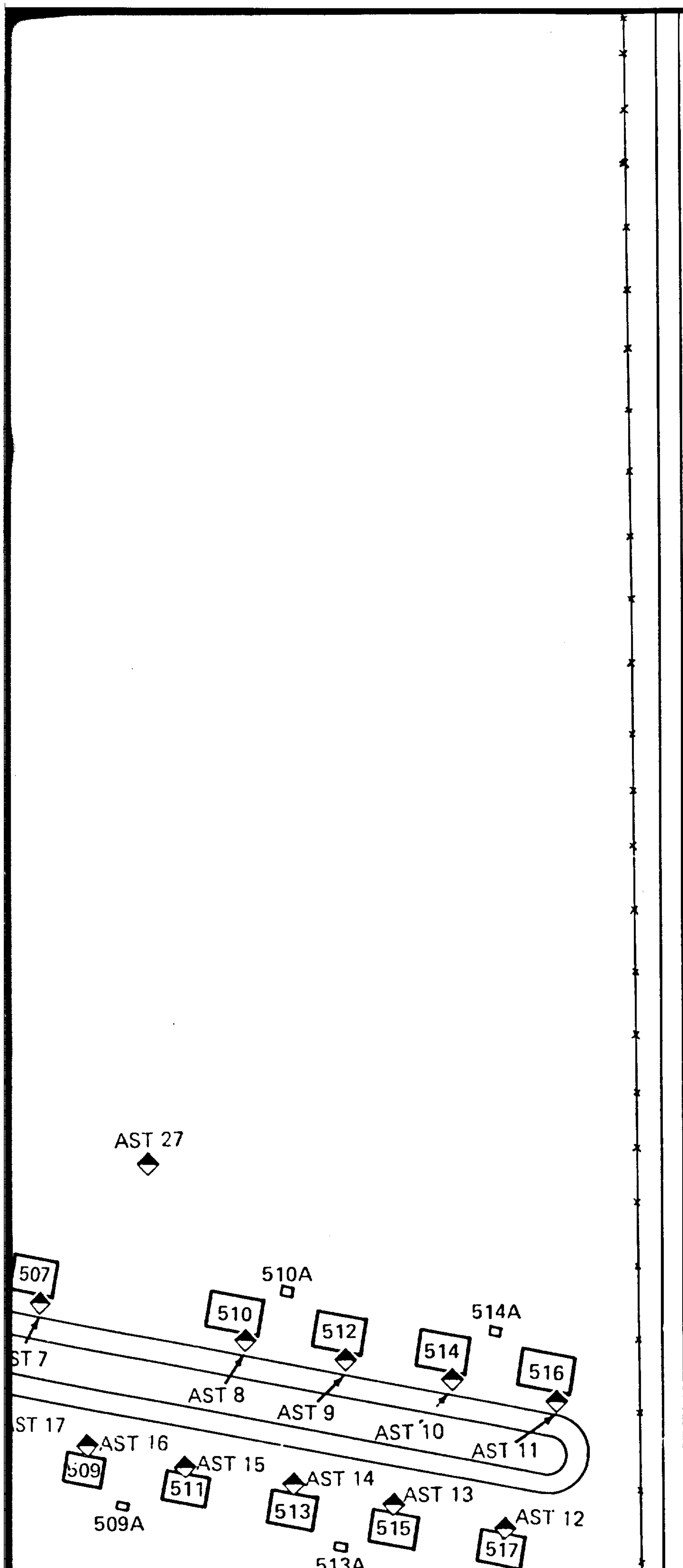


(Drum Storage
A
F28
F27


um Storage and Oil Change
Area)



F29
5 TH. AVE
AST 27
501A
501
503
505A
505
507
AST 4
AST 5
AST 6
AST 7
AST 20
AST 19
AST 18
AST 17
AST 16
502
504
506
508
509
502A
516A
509A



LEGEND:

Current and F[illegible]
Tank Locatio[illegible]

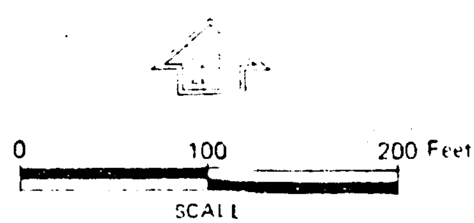
Current and F[illegible]
Storage Tank [illegible]

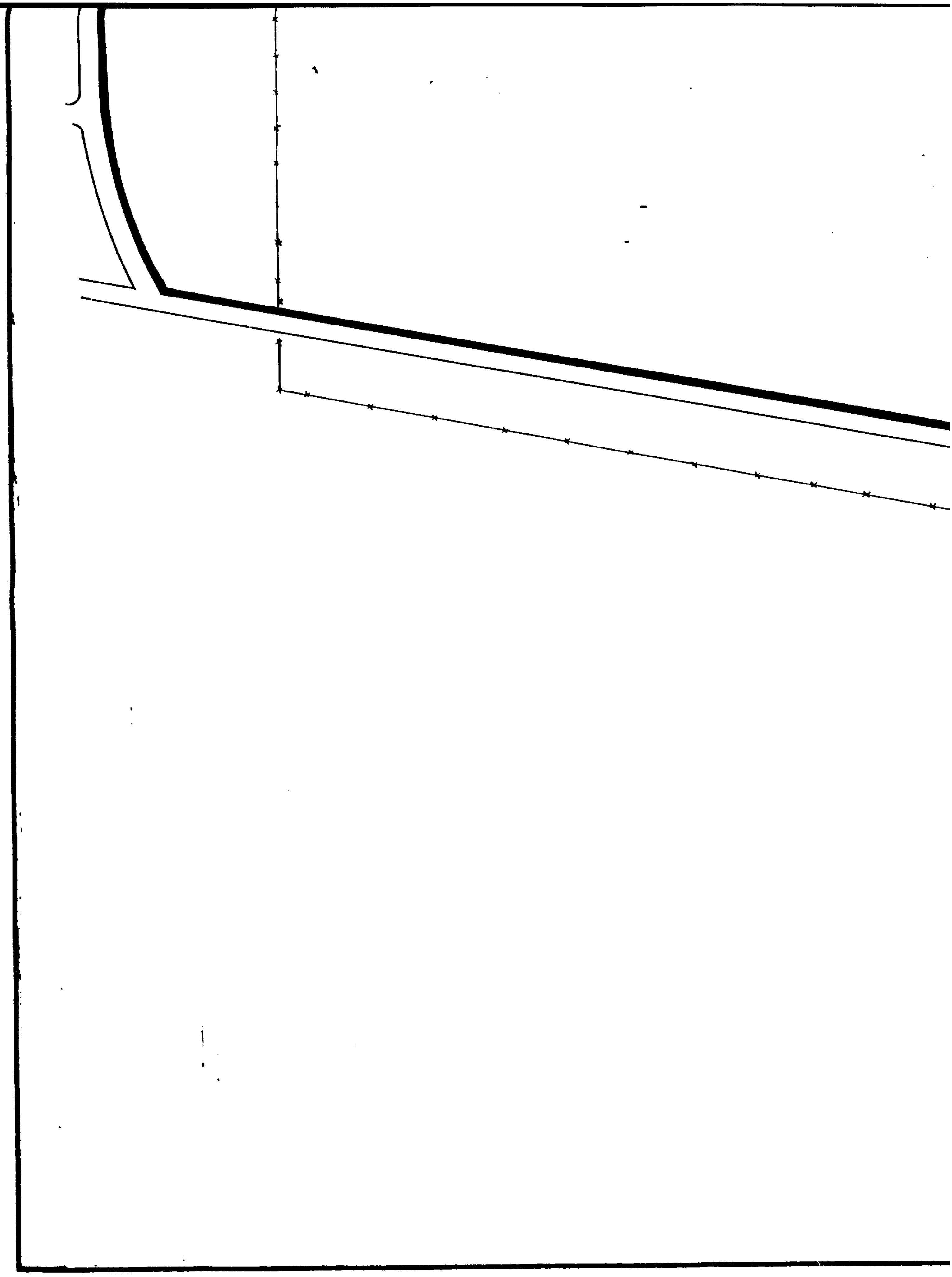
0

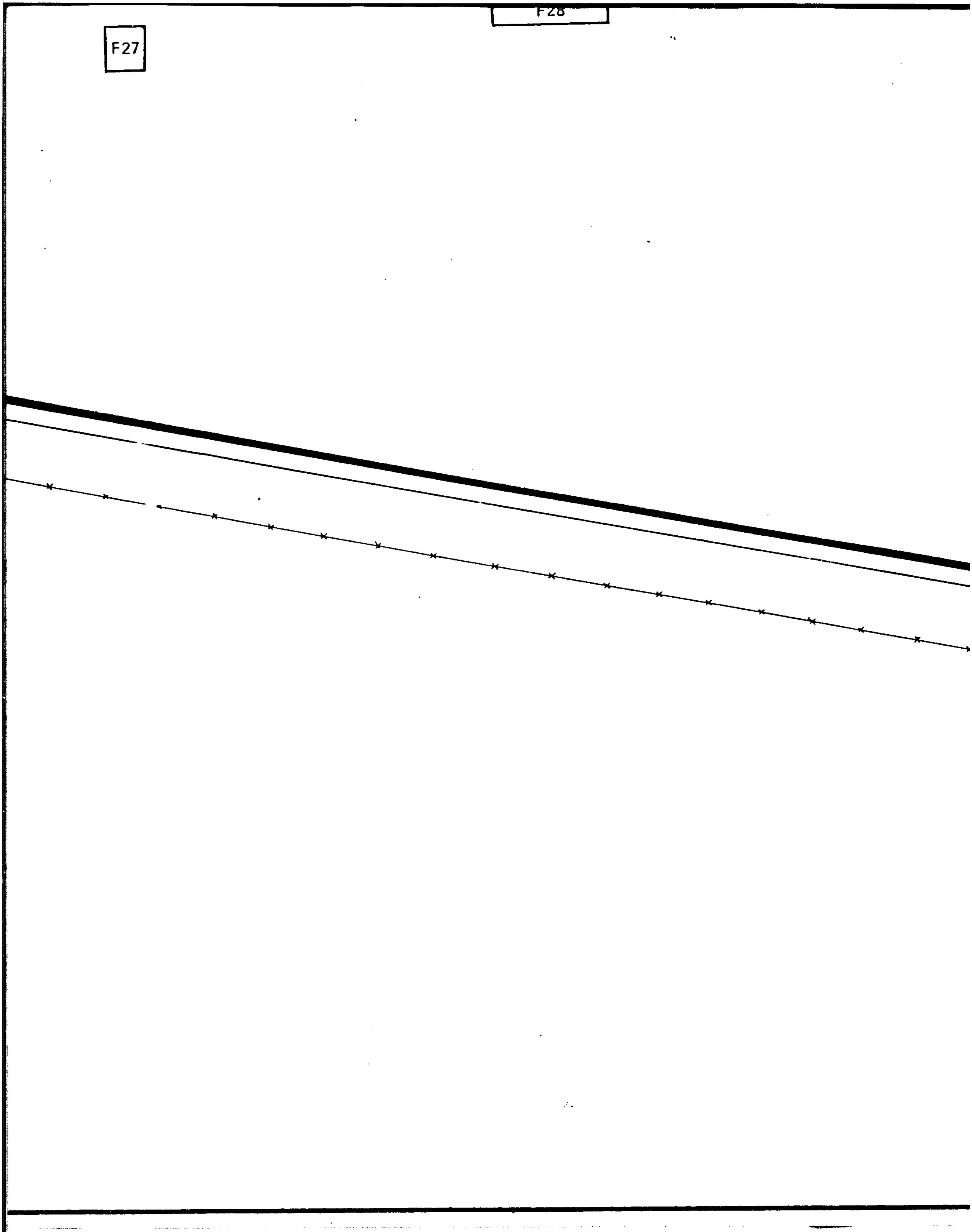
LEGEND:

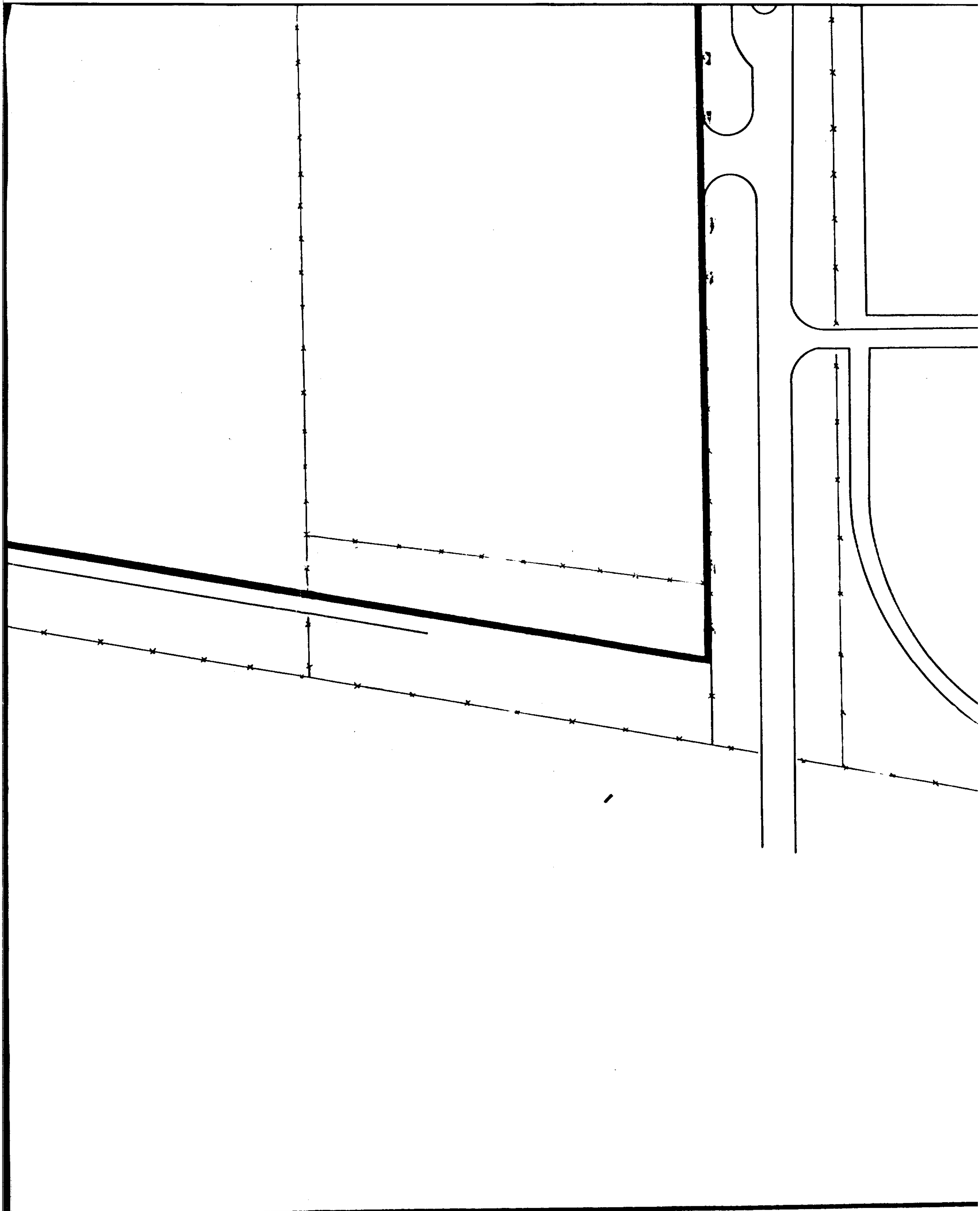
Current and Former Aboveground Storage Tank Locations

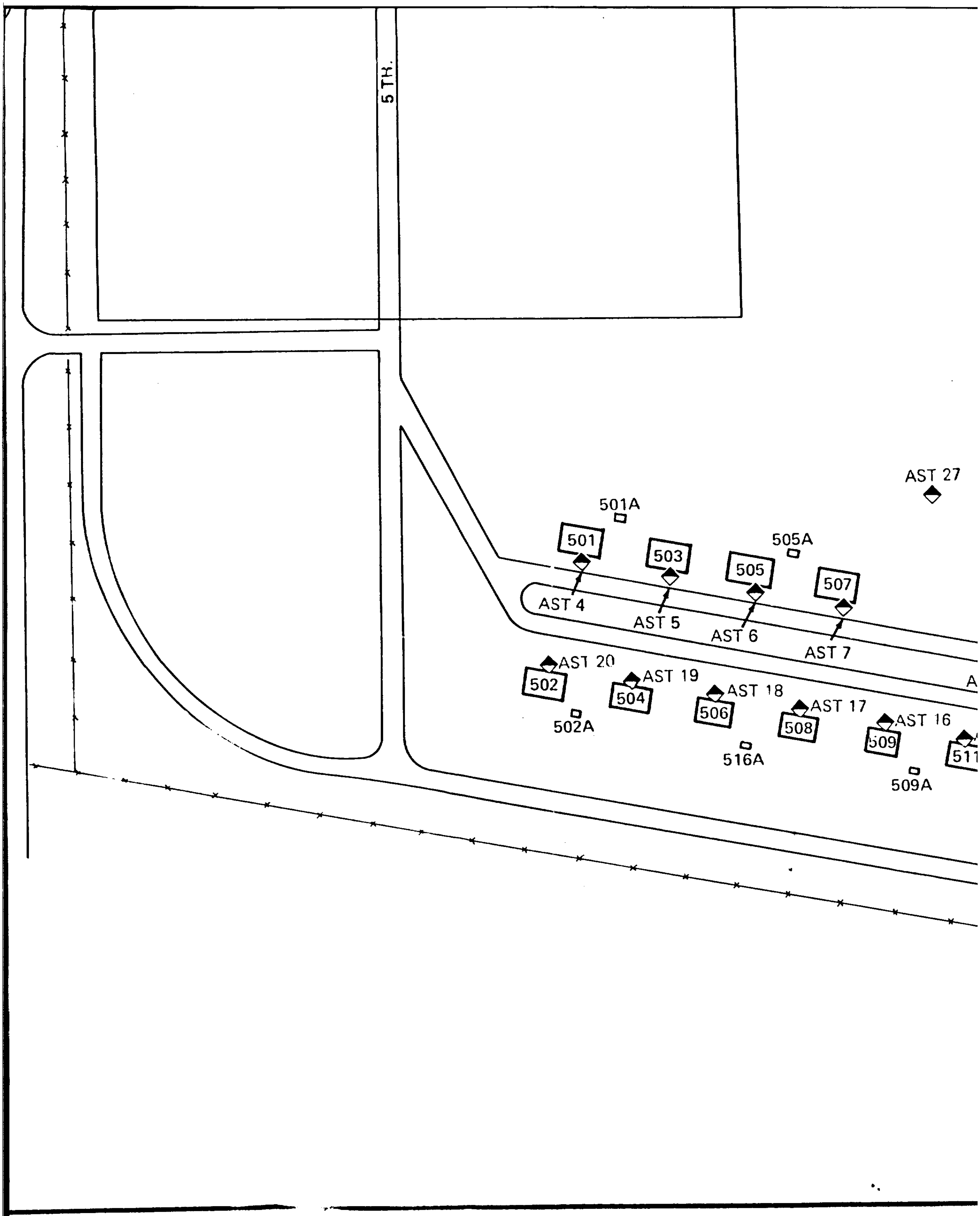
Current and Former Underground Storage Tank Locations






F28
F27




5 TH.
AST 27
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503
505A
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AST 4
AST 5
AST 6
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AST 16
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504
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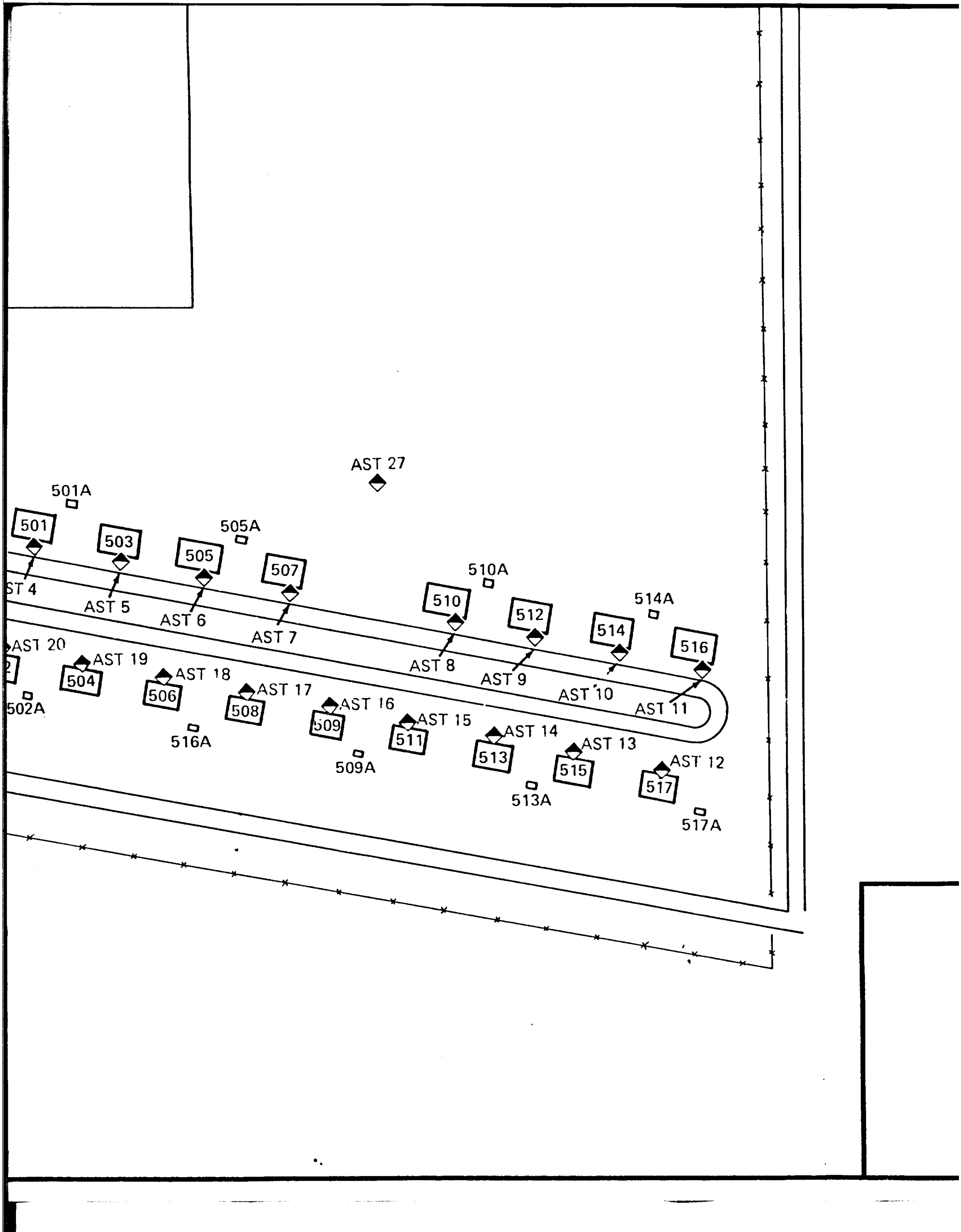
502A
516A
509A



AST 27
501A
501
503
505A
505
507
510A
510
512
514A
514
516
ST 4
AST 5
AST 6
AST 7
AST 8
AST 9
AST 10
AST 11
AST 20
AST 19
AST 18
AST 17
AST 16
AST 15
AST 14
AST 13
AST 12
504
506
508
509
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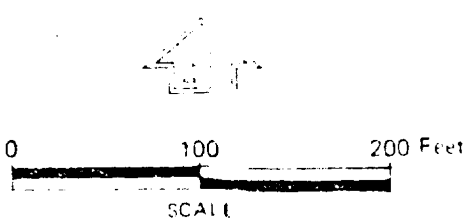
515
517
502A
516A
509A
513A
517A

LEGEND:

- Current and Former Aboveground Storage Tank Locations
- Current and Former Underground Storage Tank Locations



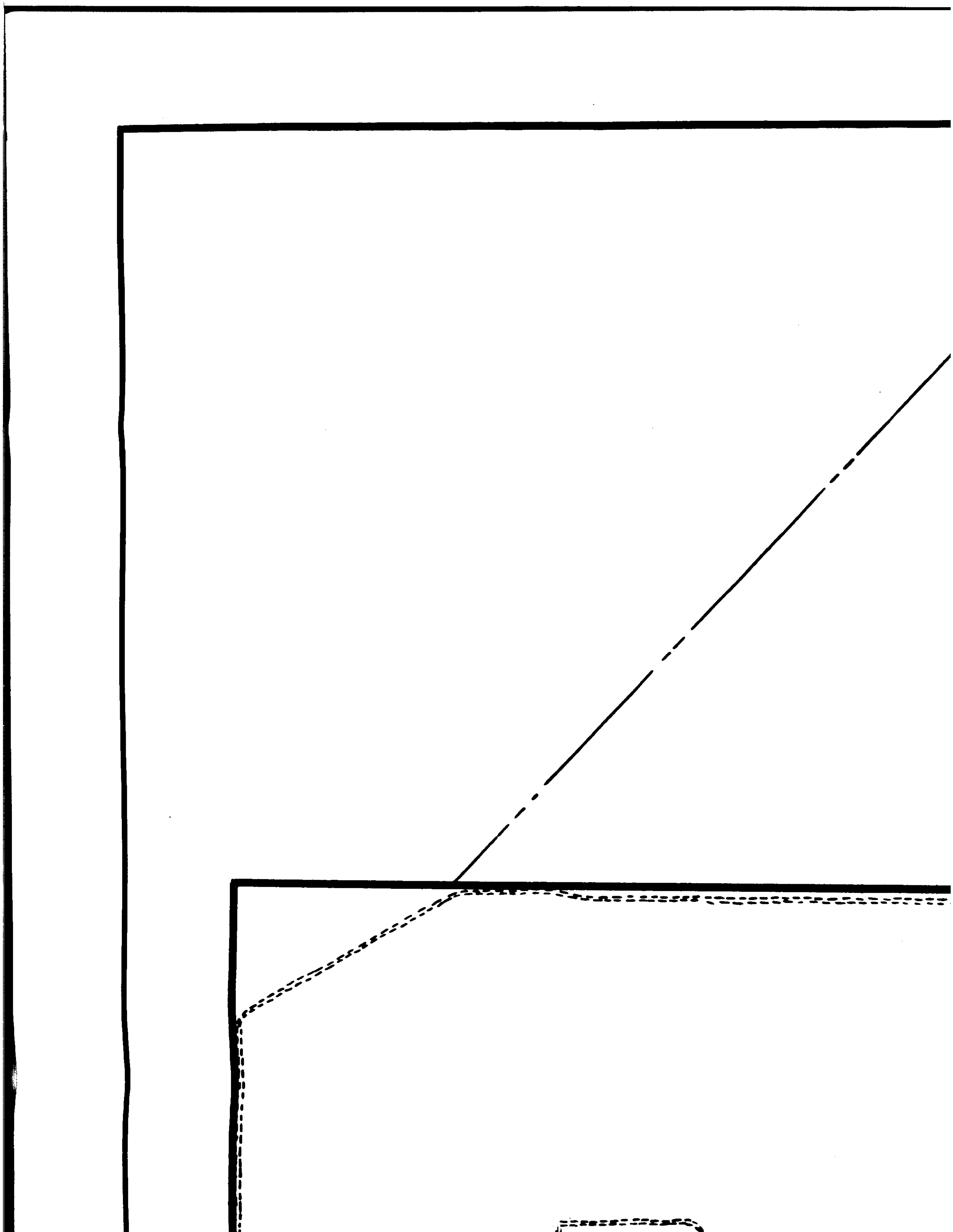
UMATILLA DEPOT ACTIVITY

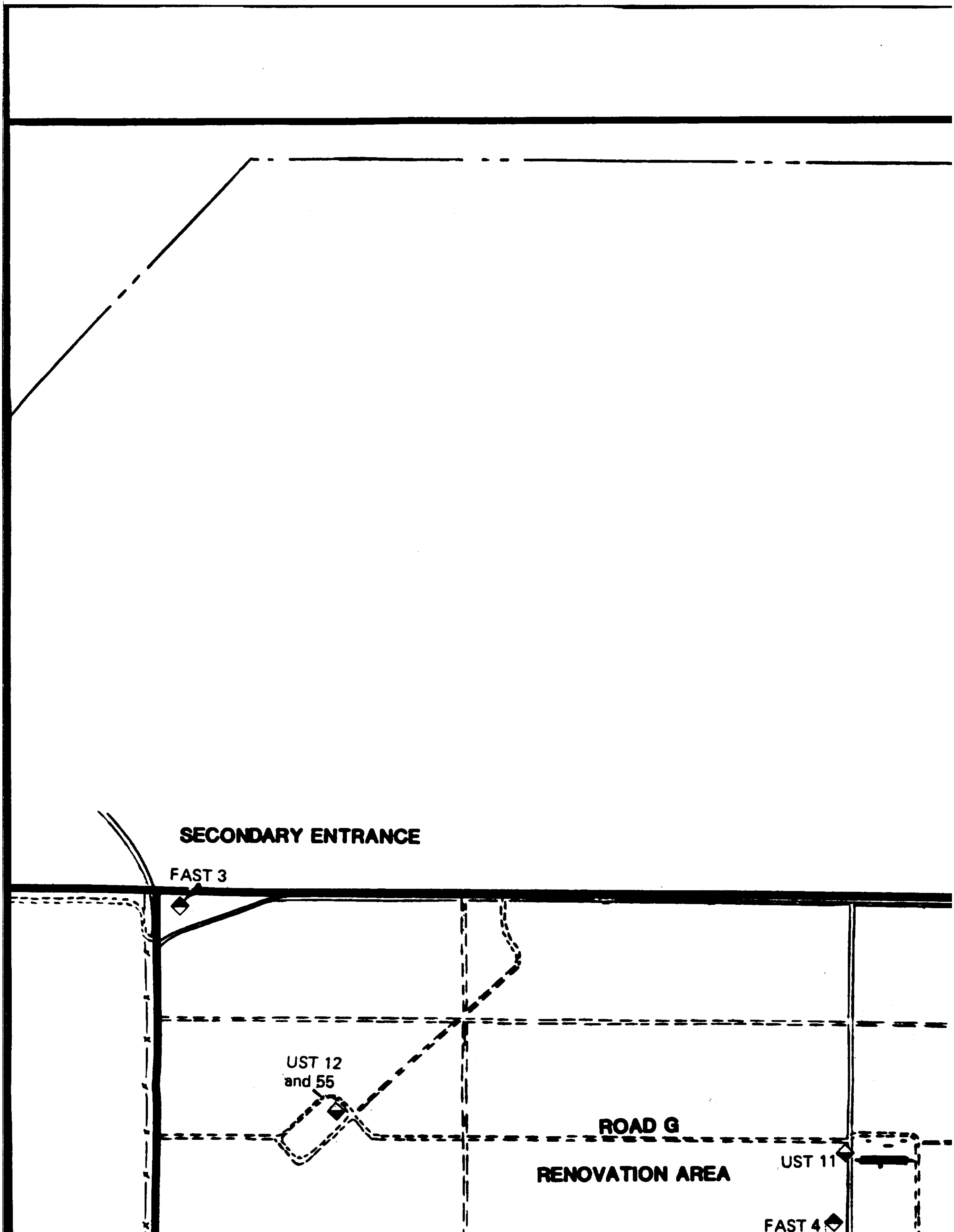
HERMISTON, OREGON

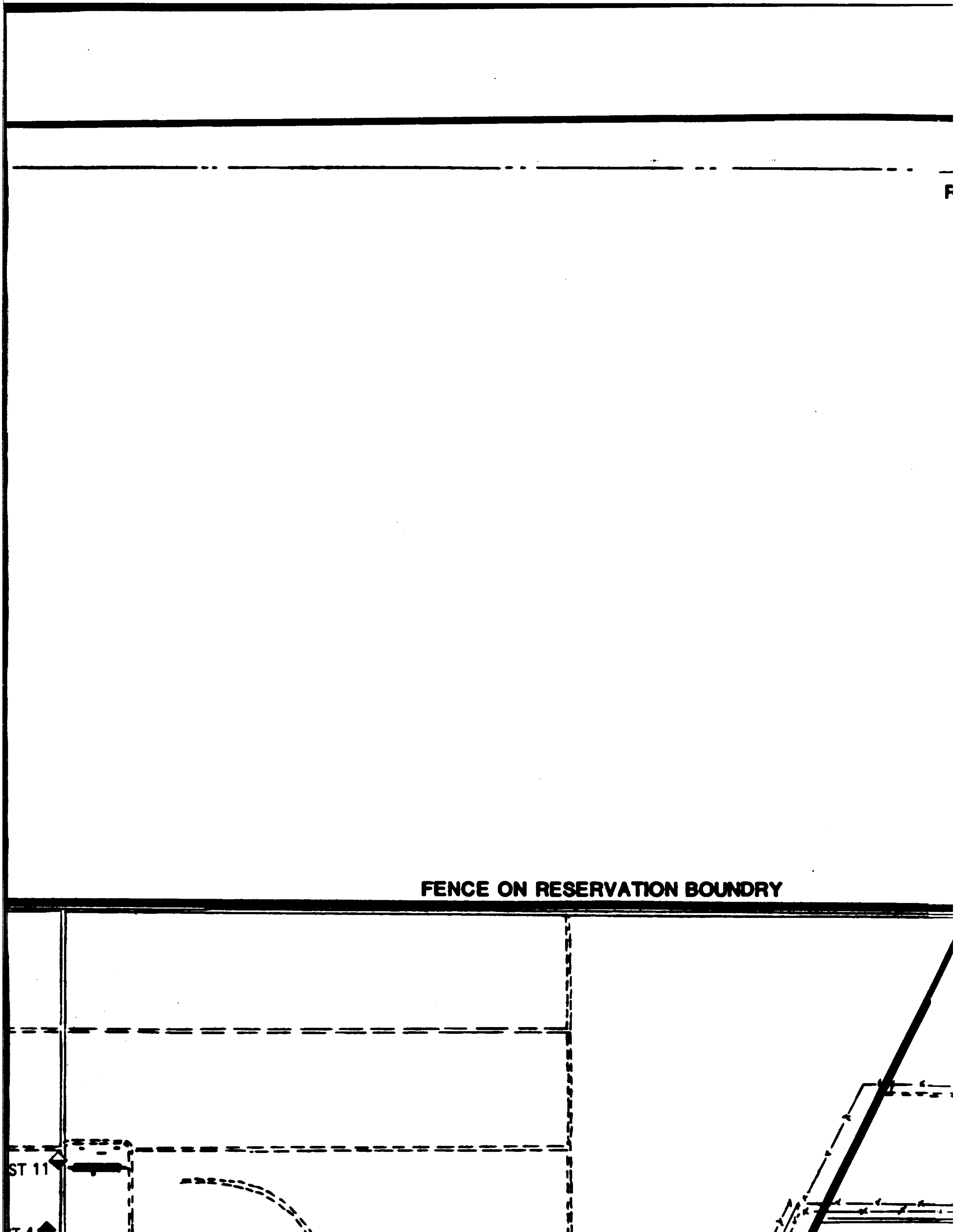
PLATE 1

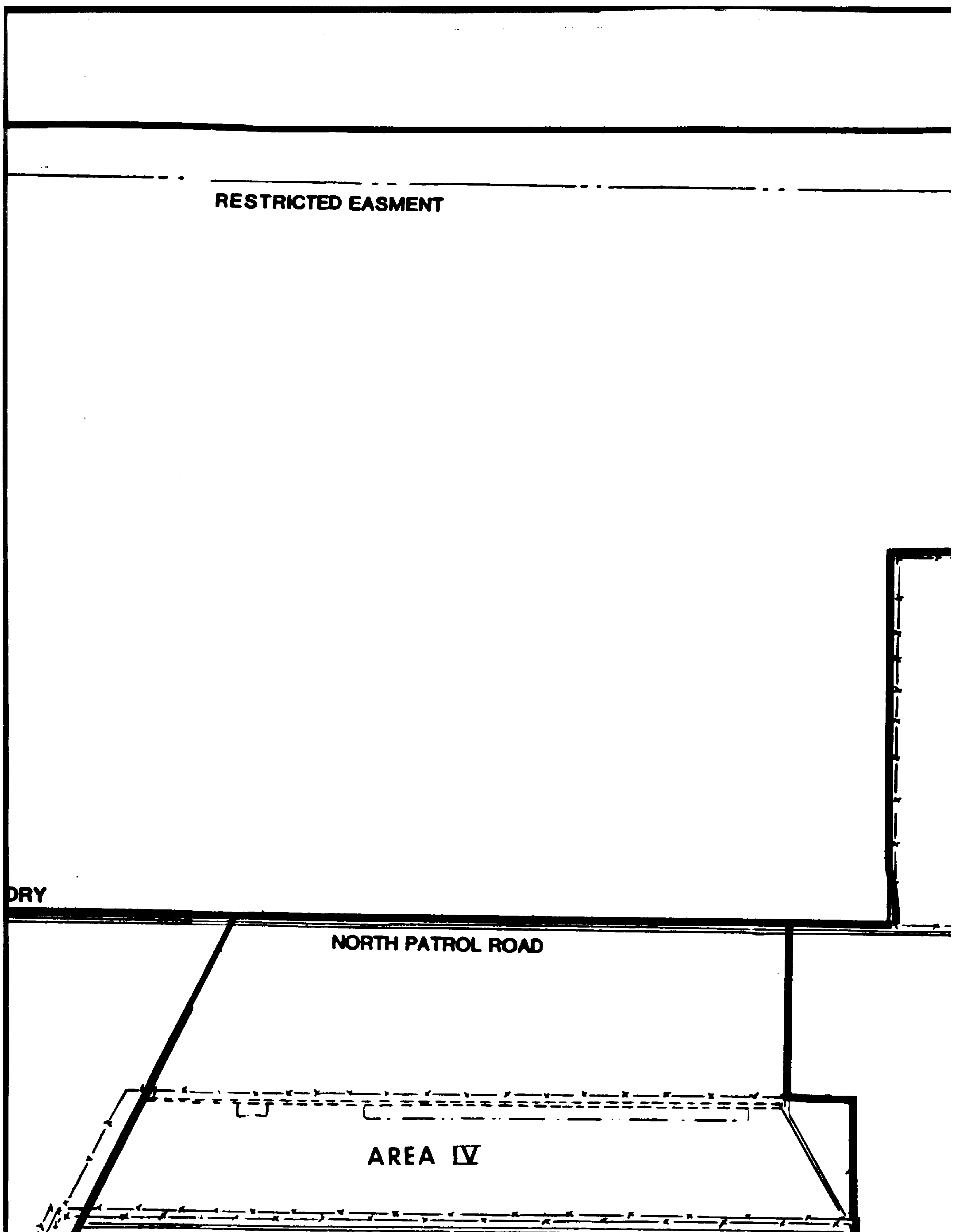
ADMINISTRATION AREA EXISTING AND FORMER UNDERGROUND AND ABOVEGROUND STORAGE TANK LOCATION MAP

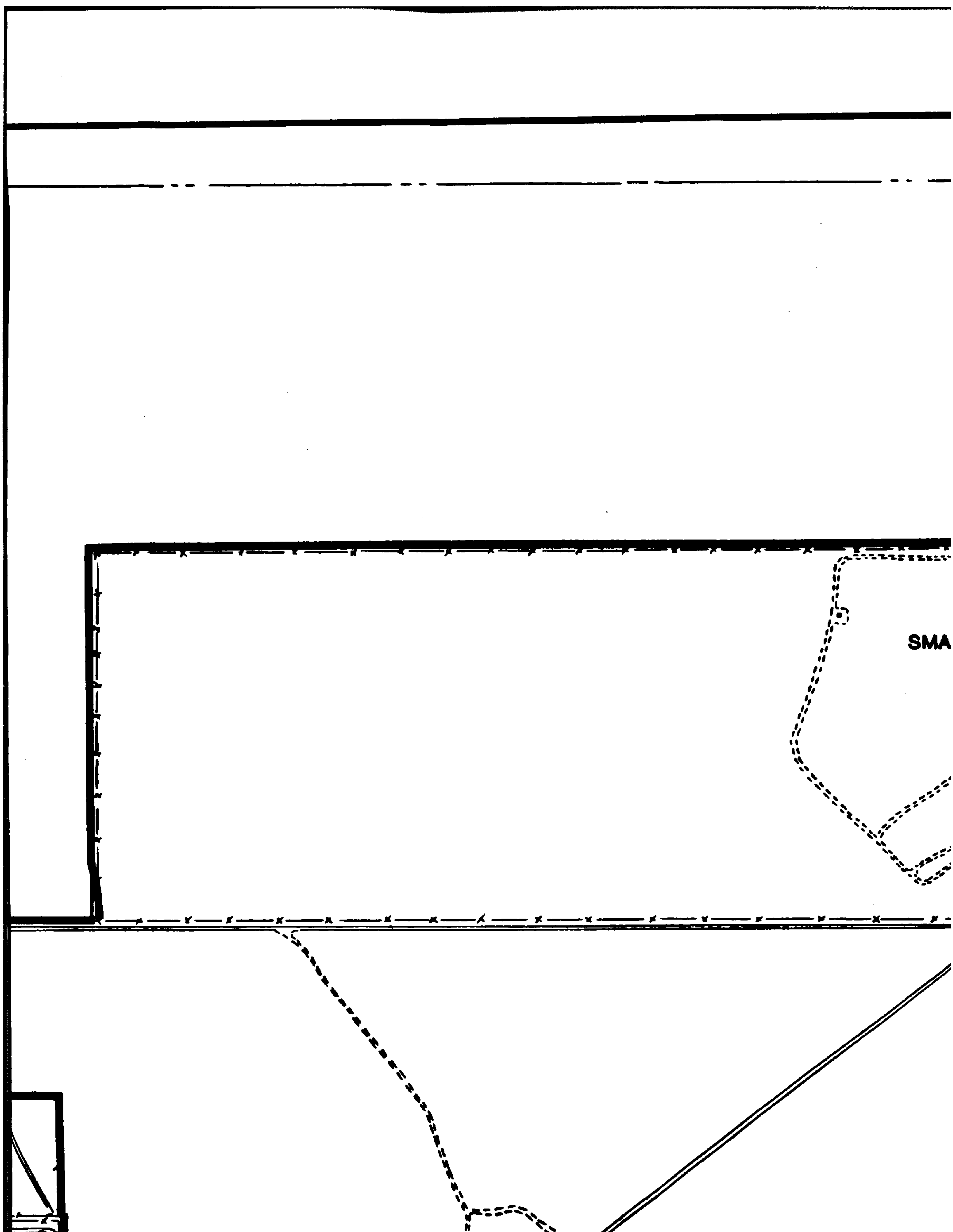
UST: June 1995

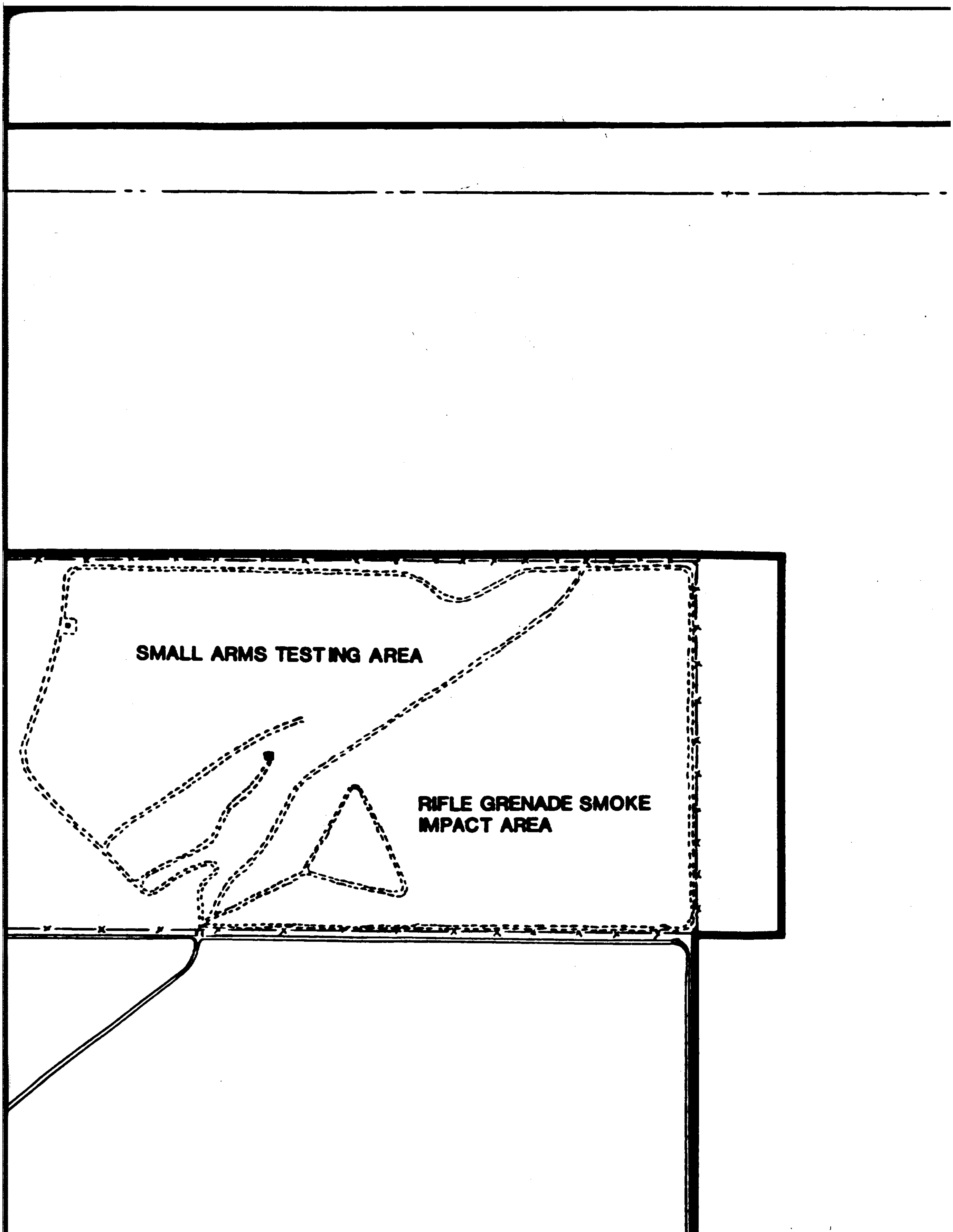


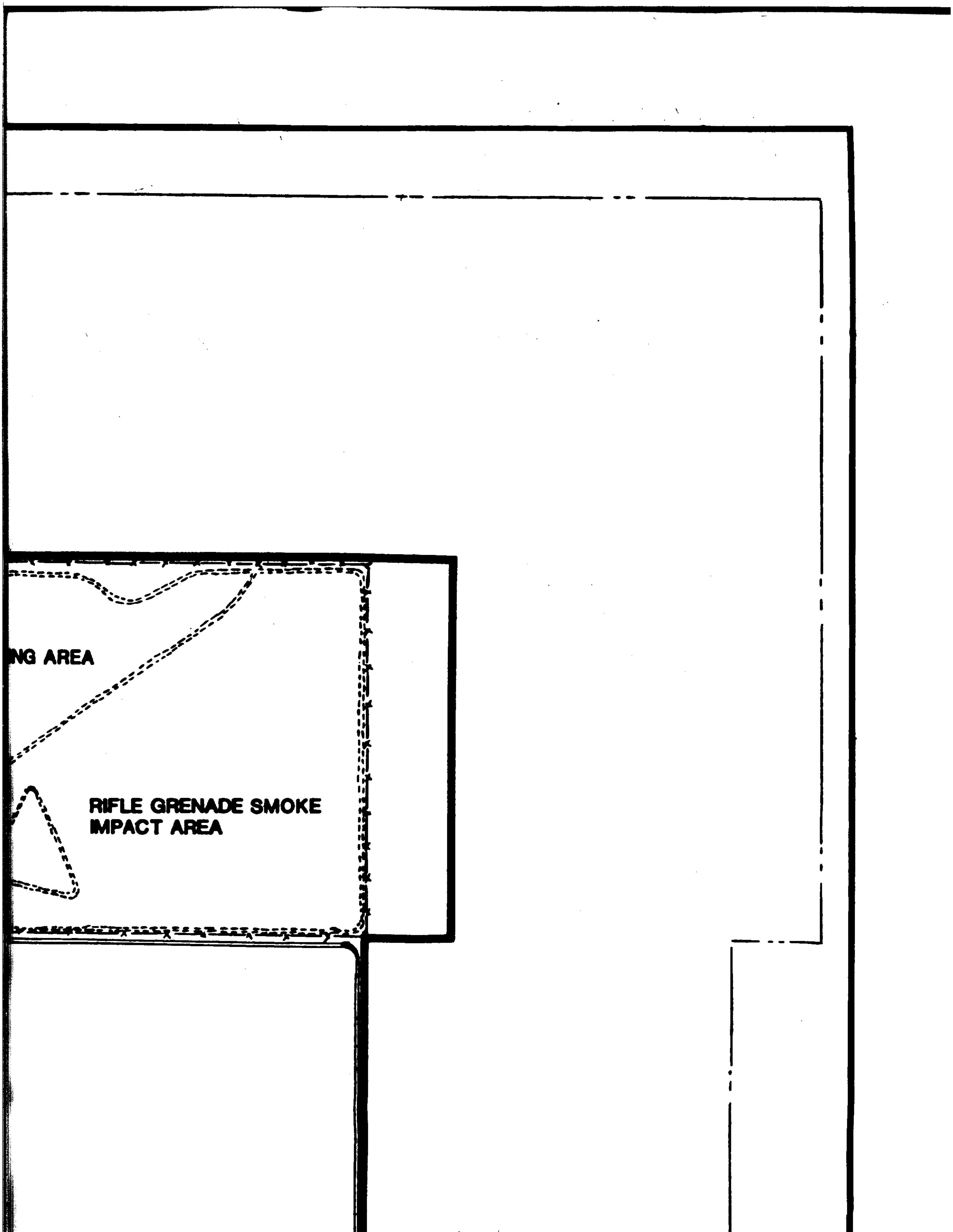

SECONDARY ENTRANCE
FAST 3
UST 12
and 55
ROAD G
RENOVATION AREA
UST 11
FAST 4

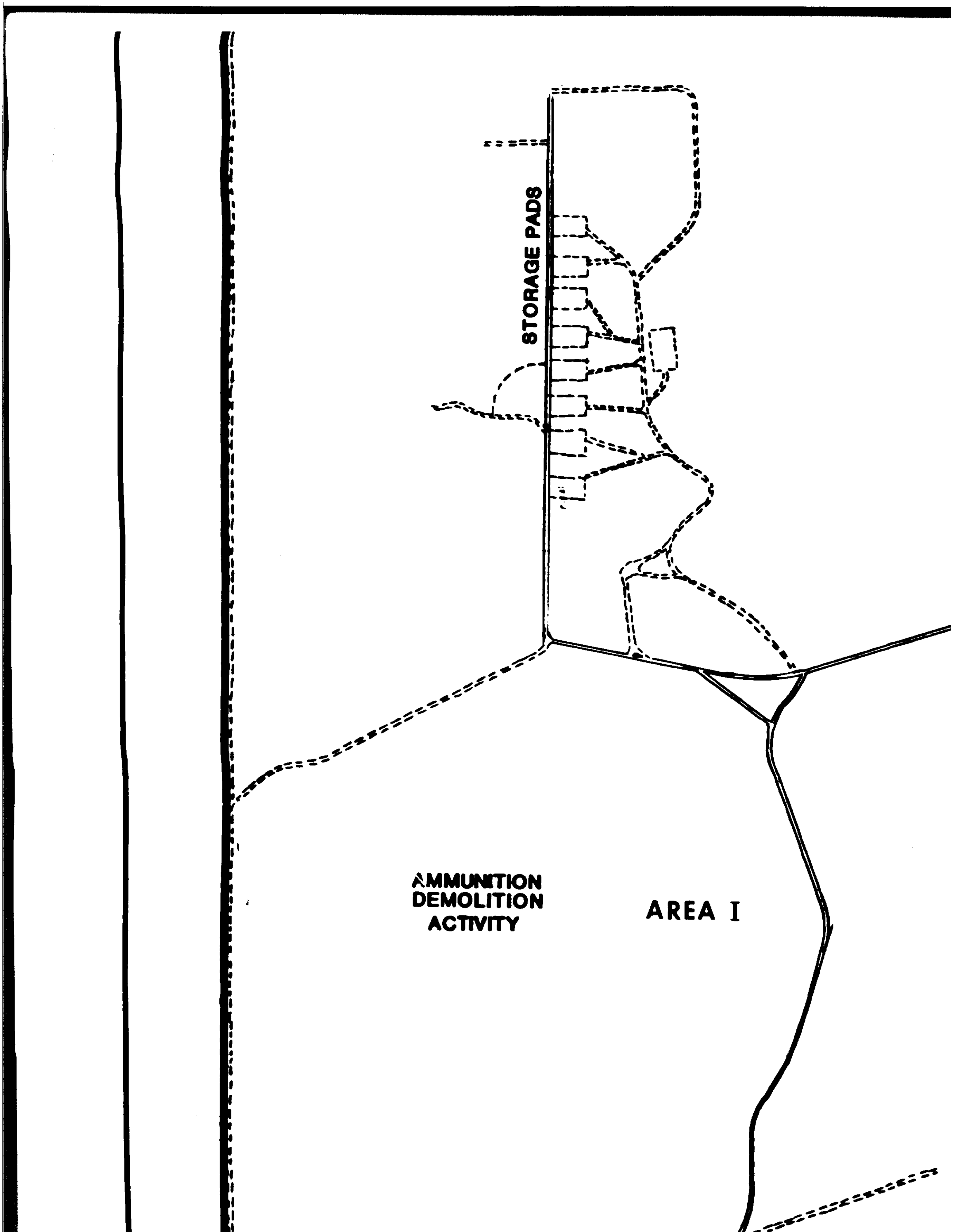

FENCE ON RESERVATION BOUNDRY
ST 11

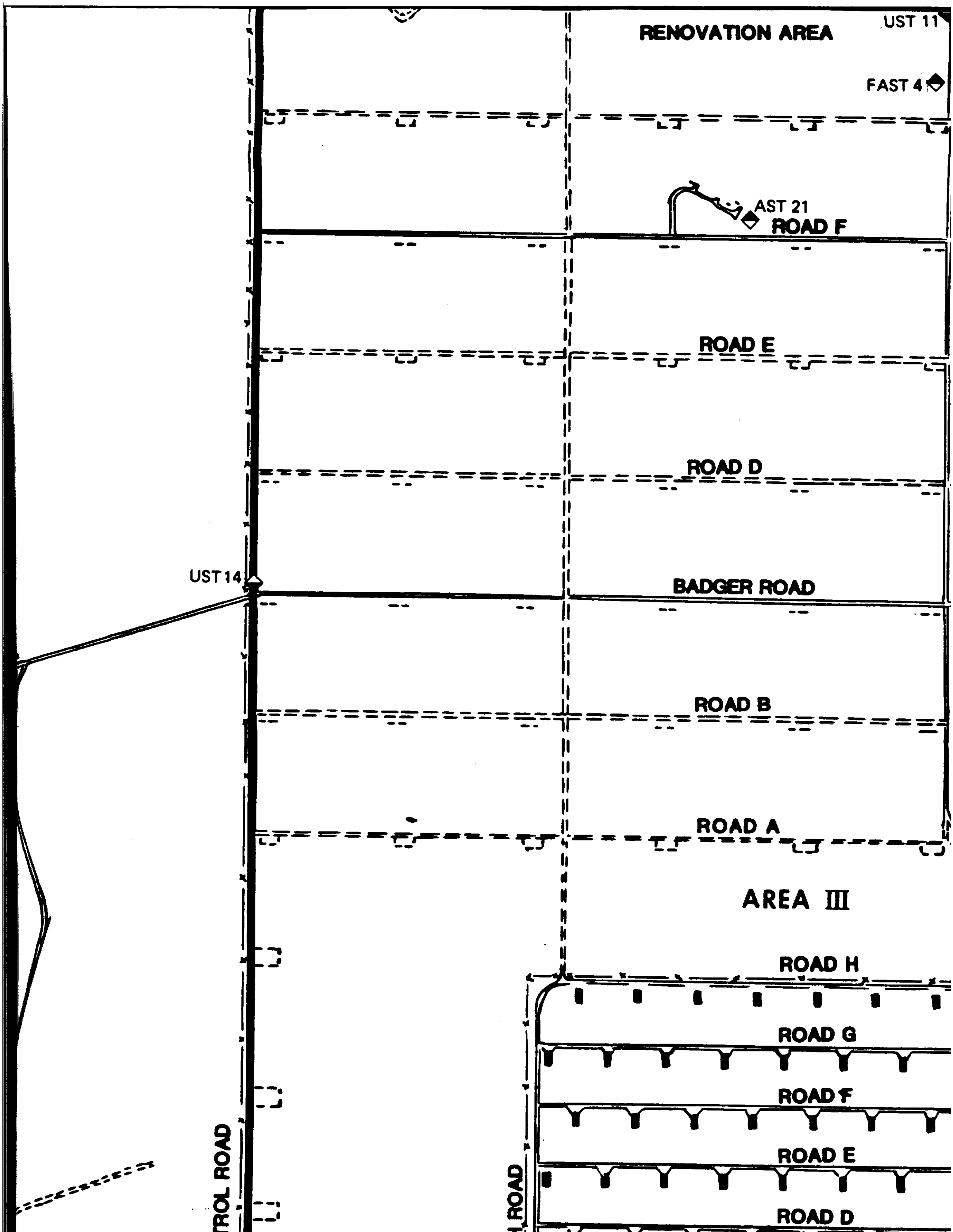

RESTRICTED EASMENT
DRY
NORTH PATROL ROAD
AREA IV

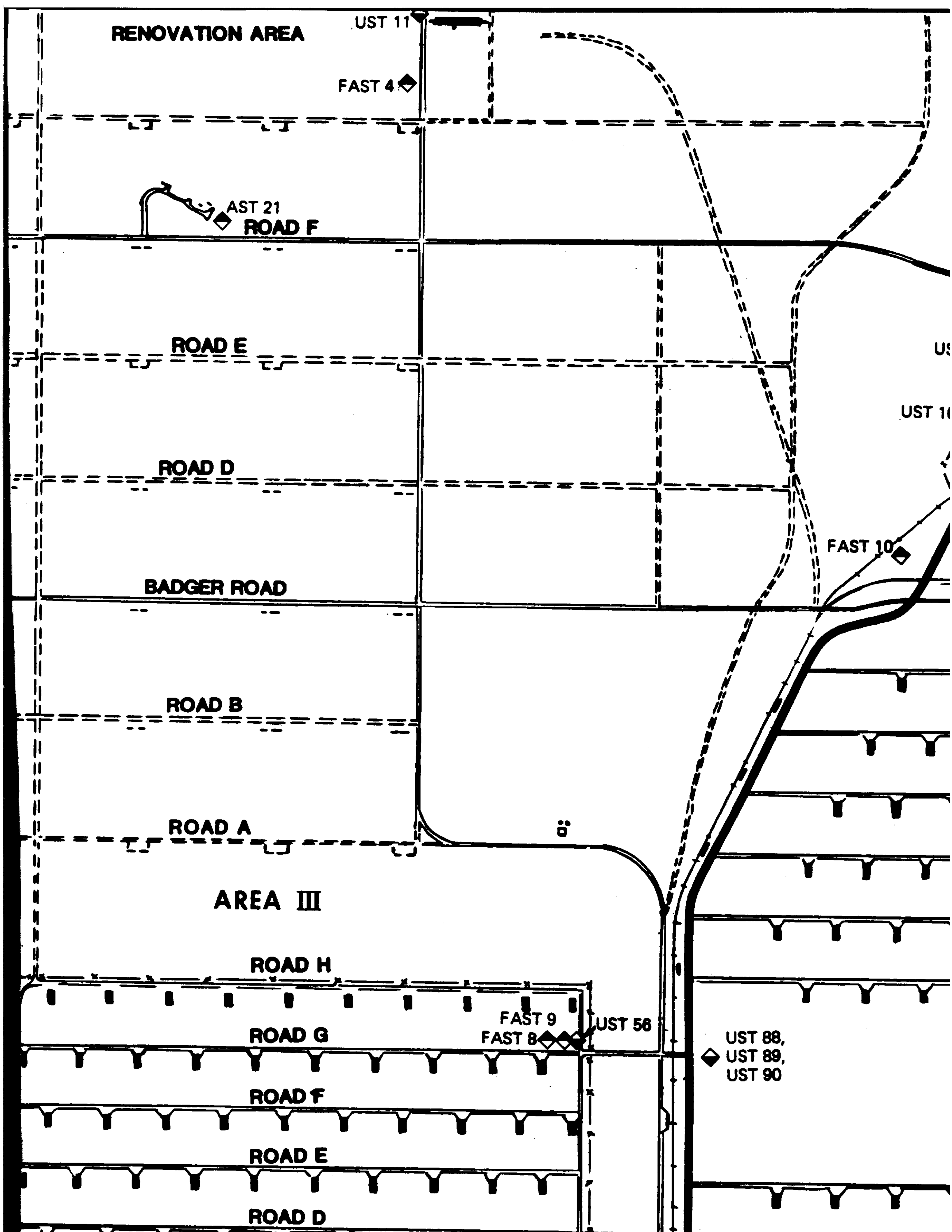

SMA

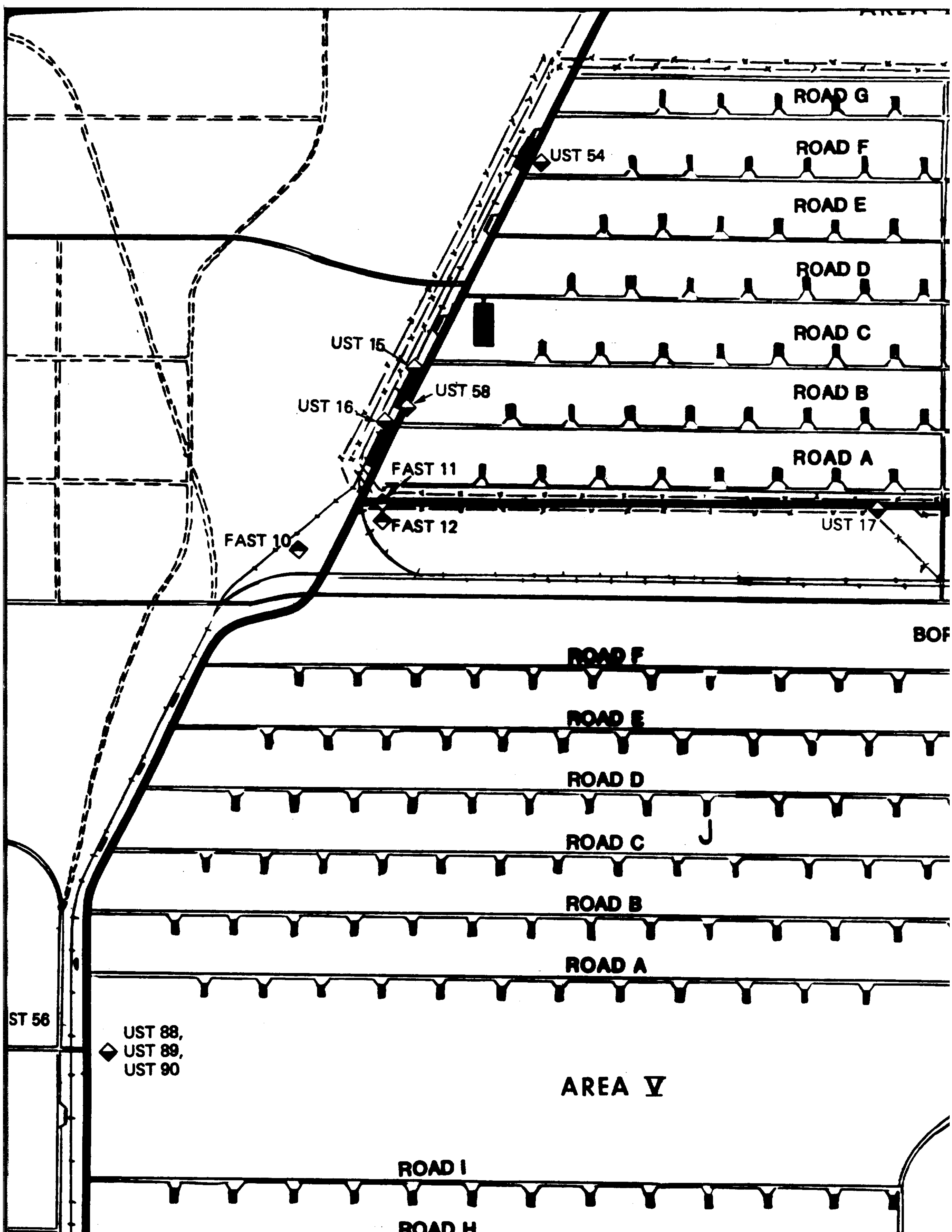

SMALL ARMS TESTING AREA
RIFLE GRENADE SMOKE
IMPACT AREA


NG AREA
RIFLE GRENADE SMOKE
IMPACT AREA

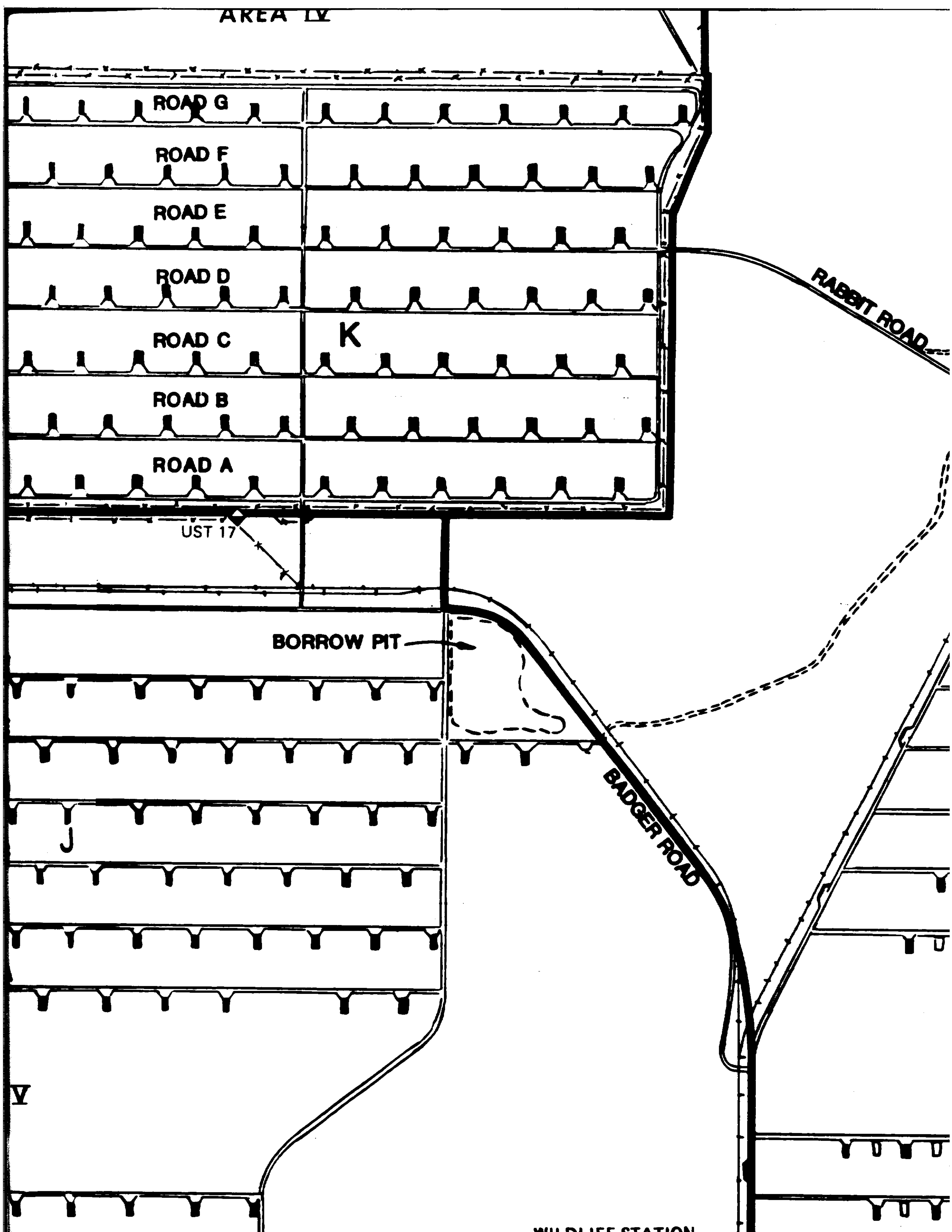

STORAGE PADS
AMMUNITION
DEMOLITION
ACTIVITY
AREA I


RENOVATION AREA
UST 11
FAST 4
AST 21
ROAD F
ROAD E
ROAD D
UST 14
BADGER ROAD
ROAD B
ROAD A
AREA III
ROAD H
ROAD G
ROAD F
ROAD E
ROAD D
TROL ROAD

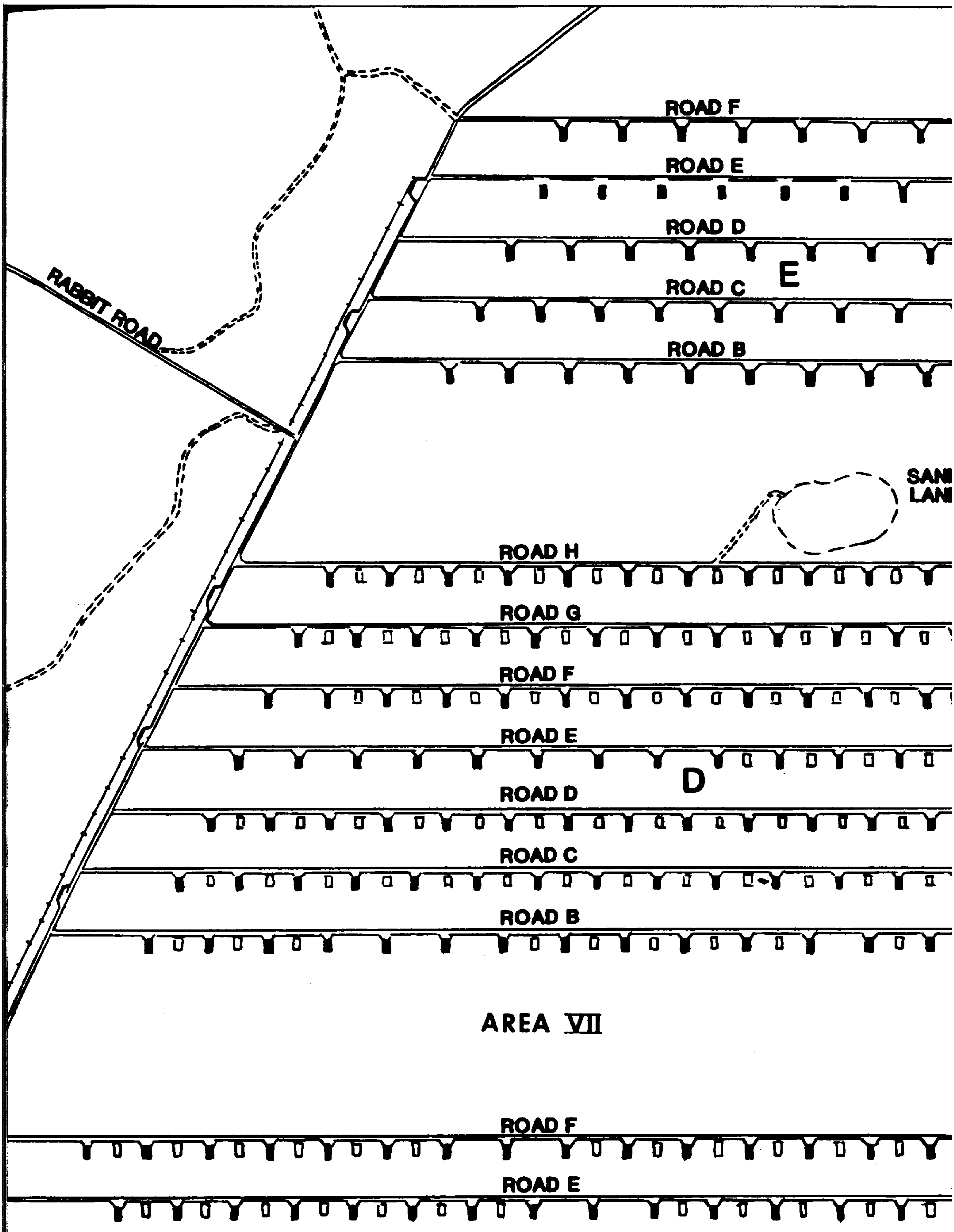

RENOVATION AREA
UST 11
FAST 4
AST 21
ROAD F
ROAD E
ROAD D
BADGER ROAD
ROAD B
ROAD A
AREA III
ROAD H
FAST 9
FAST 8
UST 56
ROAD G
UST 88,
UST 89,
UST 90
ROAD F
ROAD E
ROAD D
FAST 10

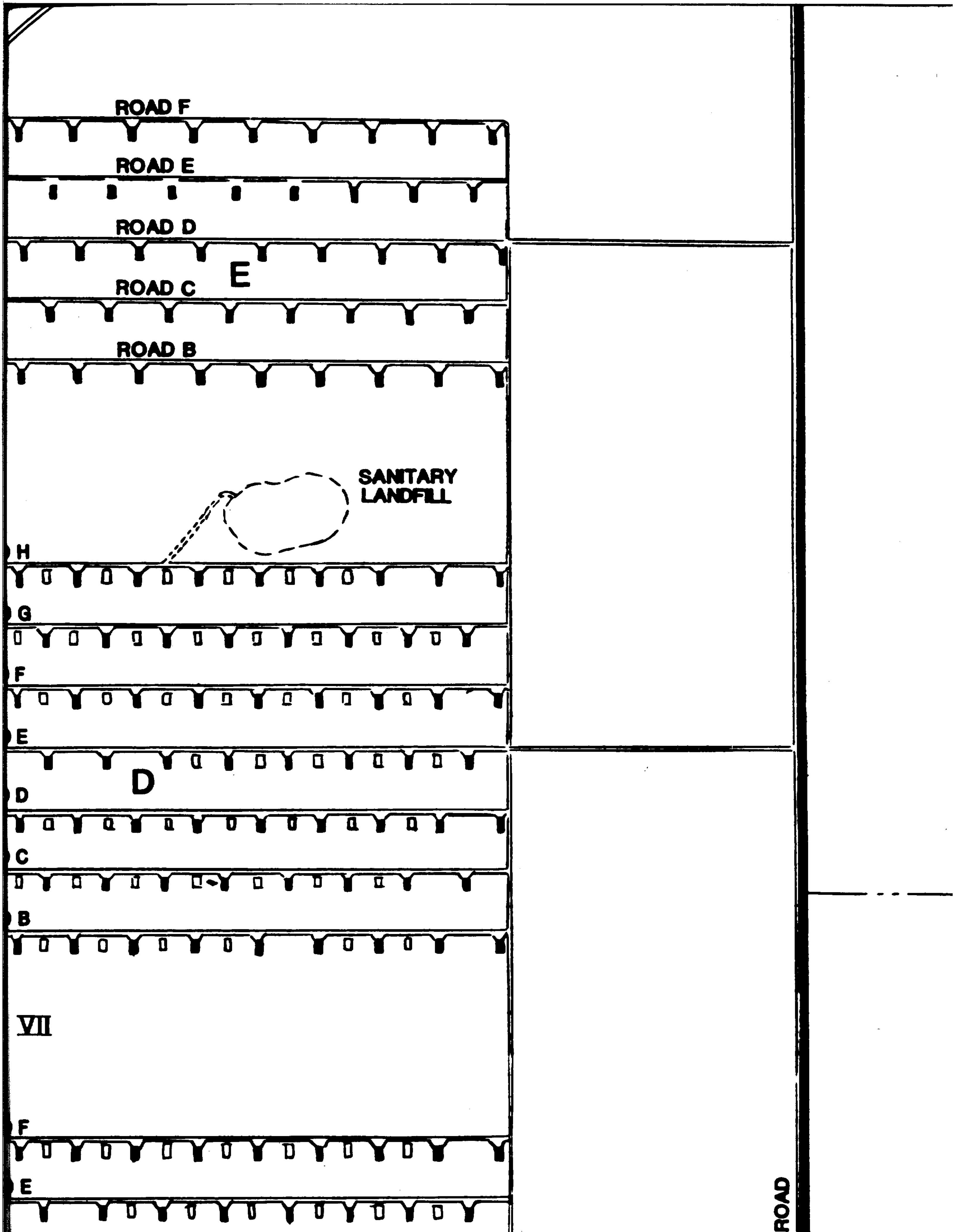


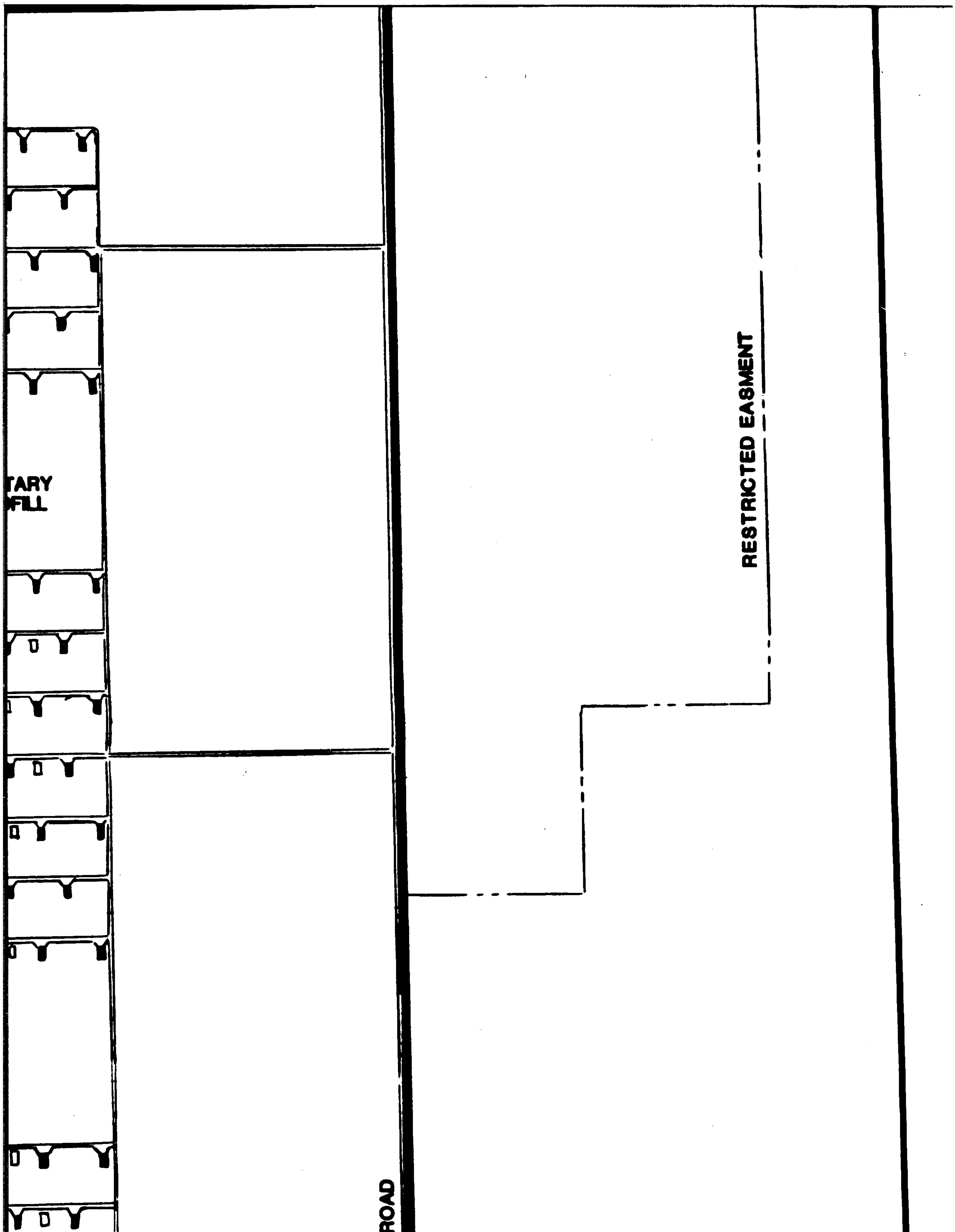
ROAD G
UST 54
ROAD F
ROAD E
ROAD D
ROAD C
UST 15
UST 58
ROAD B
UST 16
FAST 11
ROAD A
FAST 12
UST 17
FAST 10
ROAD F
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
ST 56
UST 88,
UST 89,
UST 90
AREA V
ROAD I
ROAD H

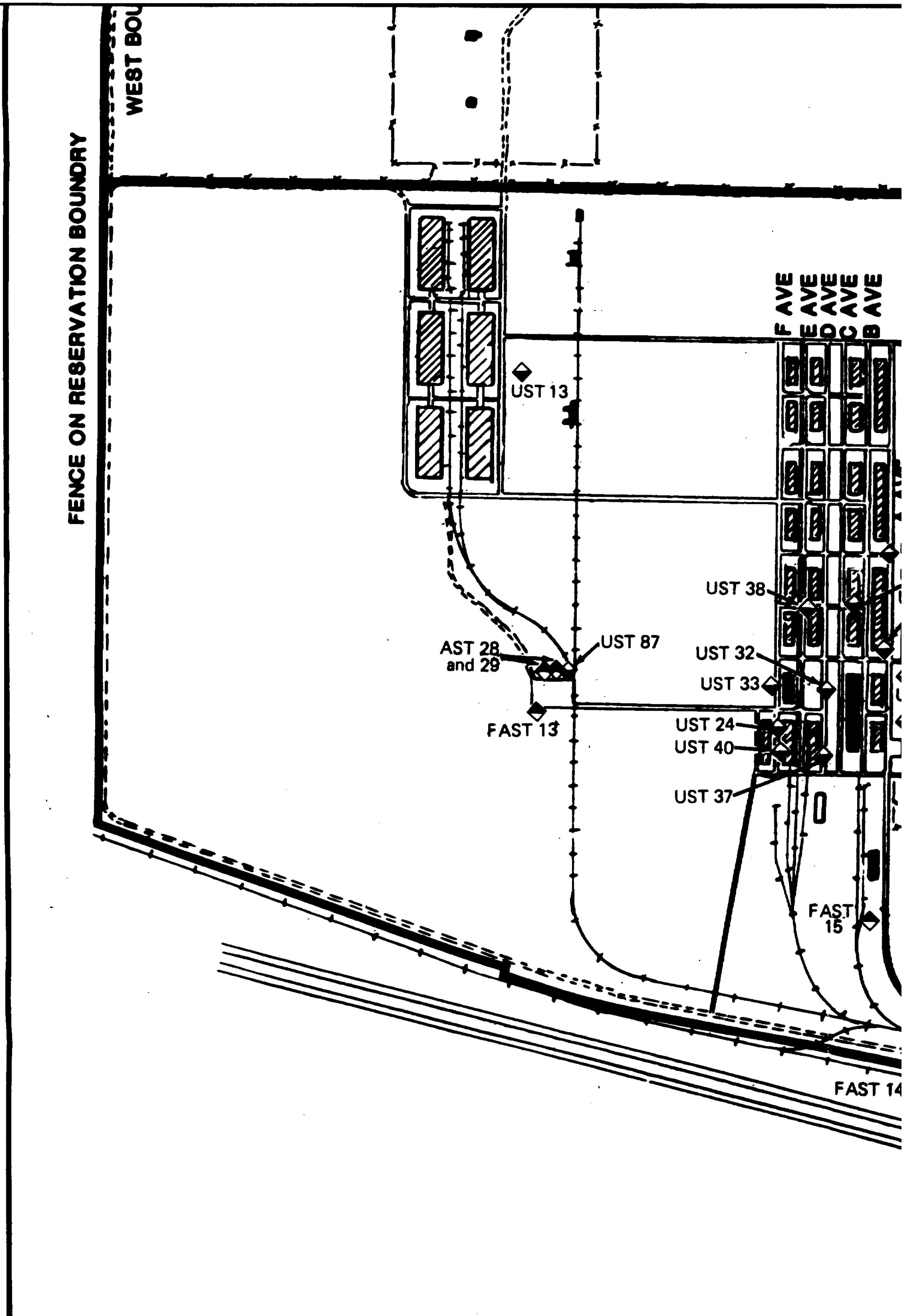


AREA IV
ROAD G
ROAD F
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
K
RABBIT ROAD
UST 17
BORROW PIT
J
BADGER ROAD
V

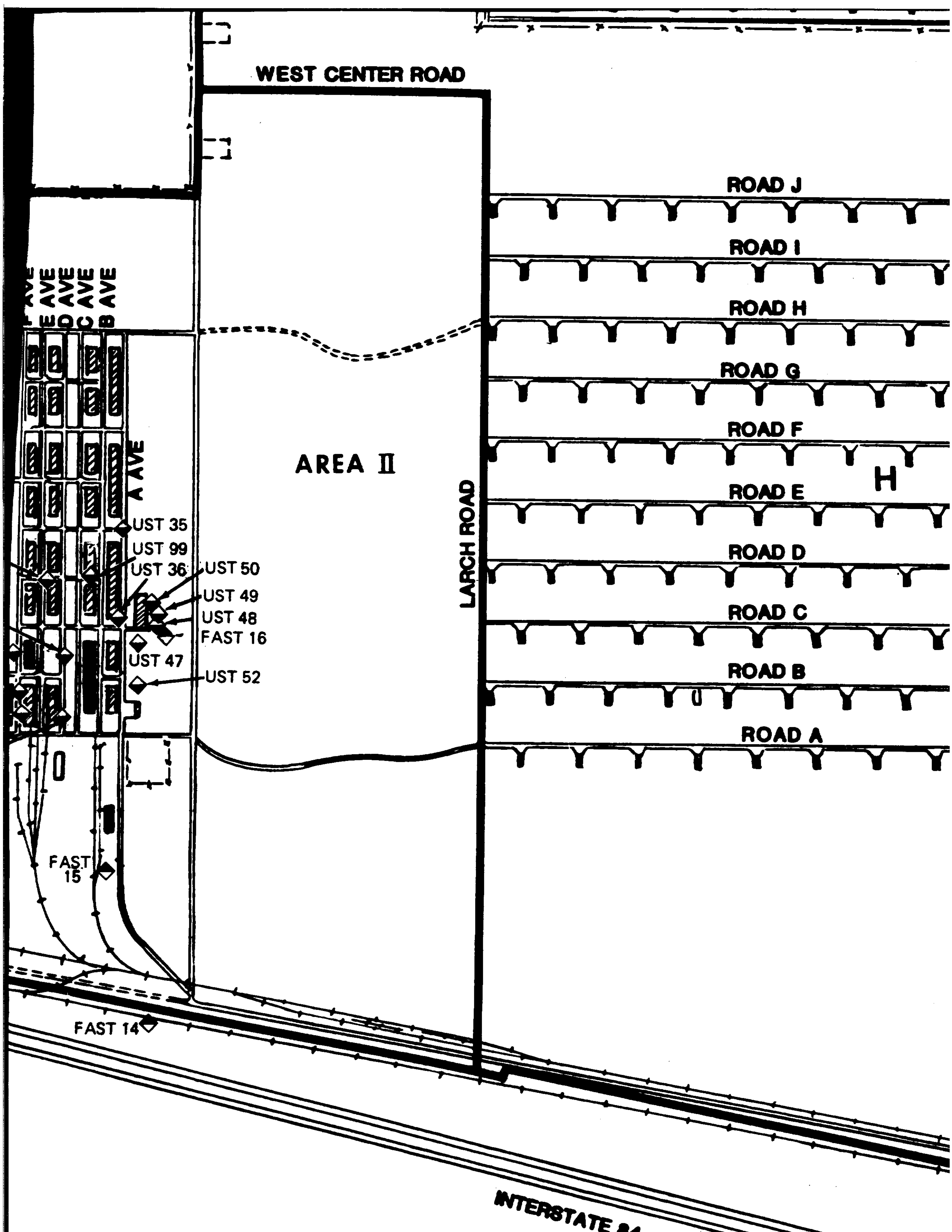

RABBIT ROAD
ROAD F
ROAD E
ROAD D
E
ROAD C
ROAD B
SAN
LAN
ROAD H
ROAD G
ROAD F
ROAD E
D
ROAD D
ROAD C
ROAD B
AREA VII
ROAD F
ROAD E

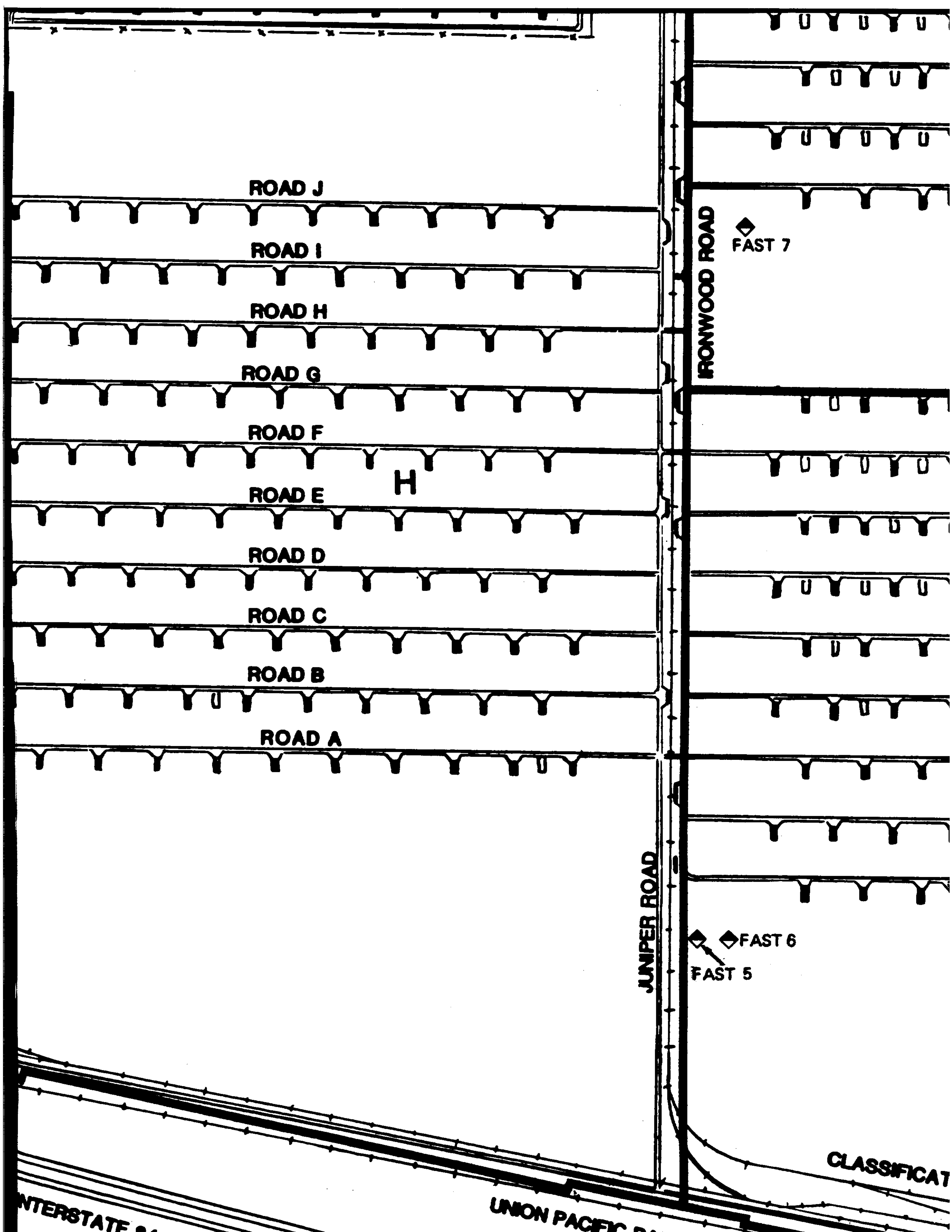

ROAD F
ROAD E
ROAD D
E
ROAD C
ROAD B
SANITARY LANDFILL
H
G
F
E
D
D
C
B
VII
F
E
ROAD


TARY
FILL
RESTRICTED EASMENT
ROAD

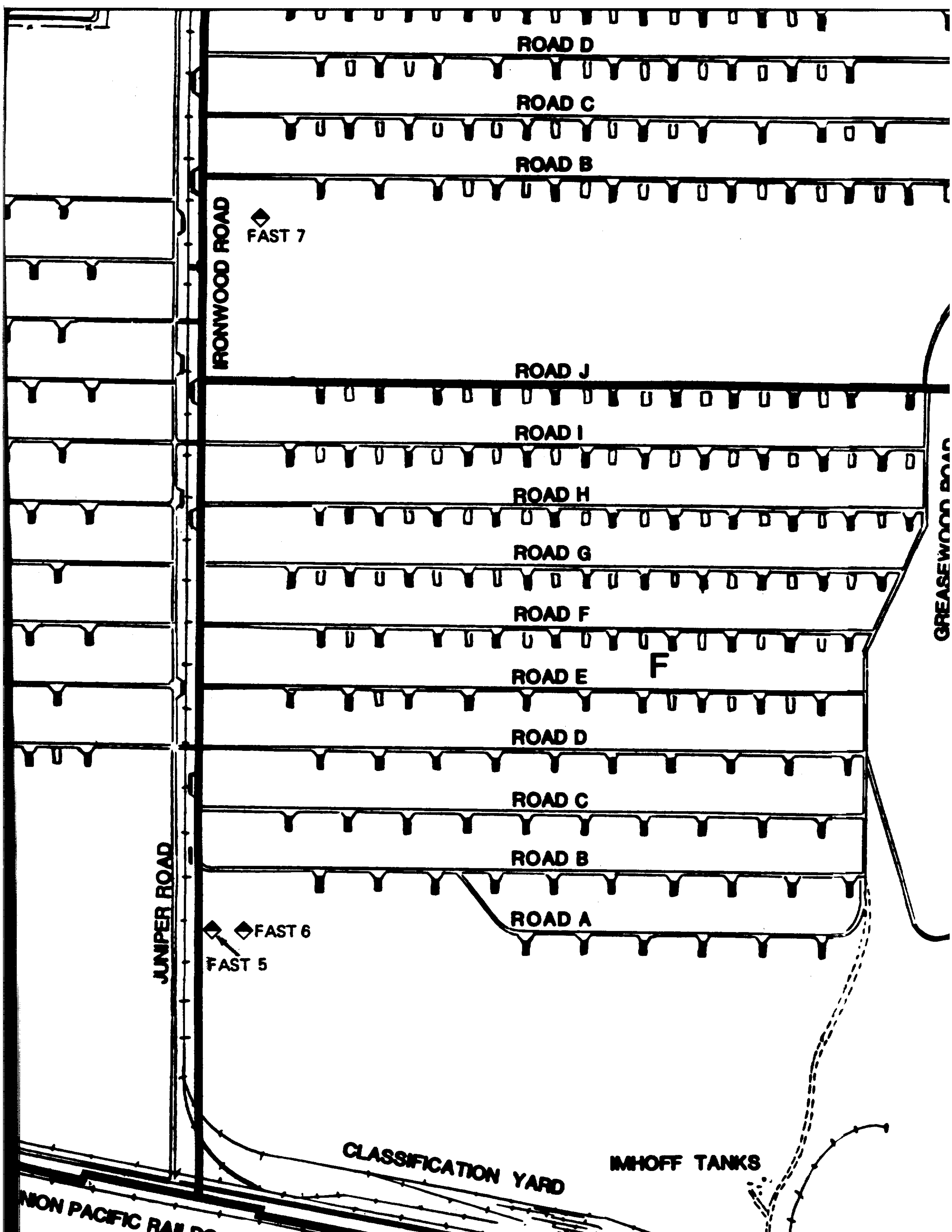


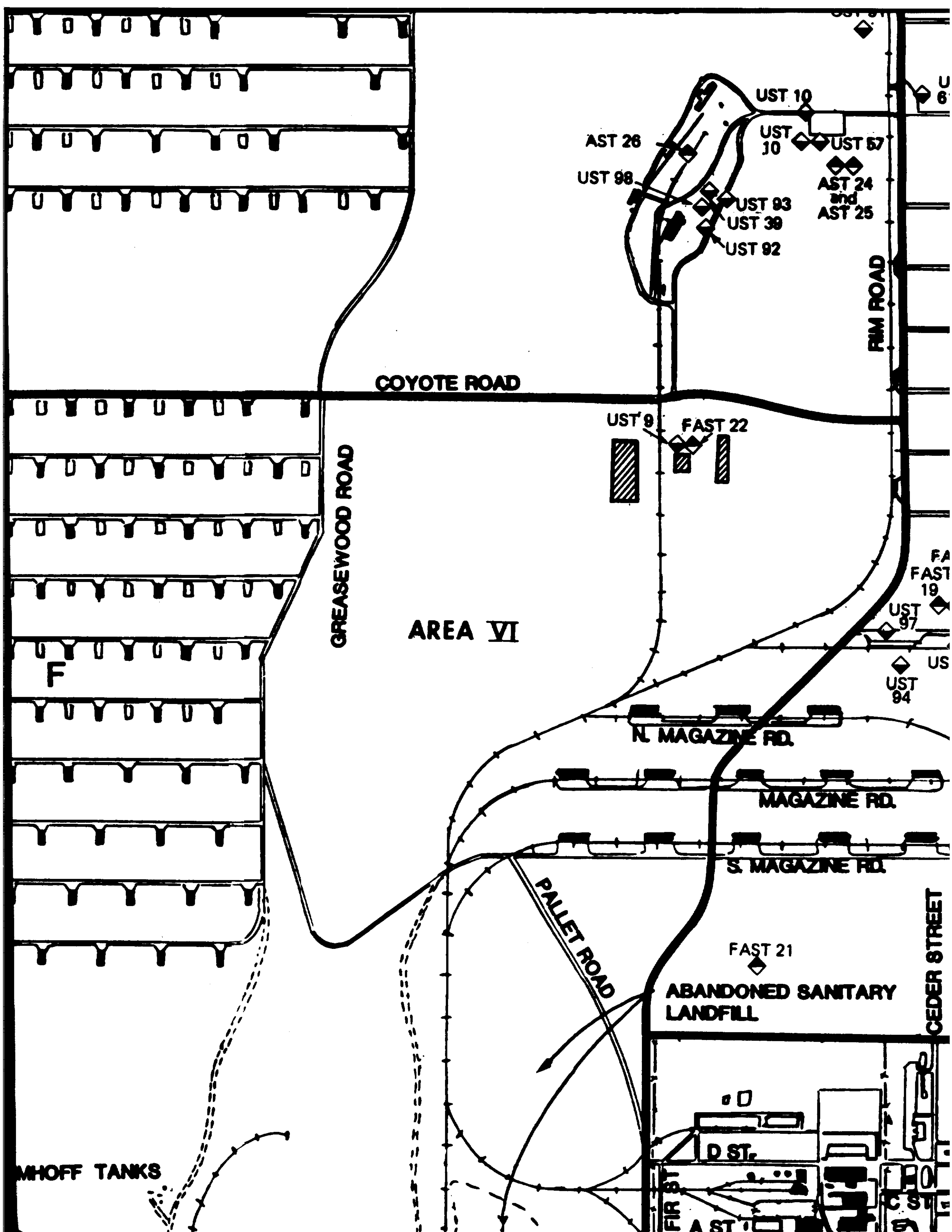
FENCE ON RESERVATION BOUNDRY
WEST BOU
F AVE
E AVE
D AVE
C AVE
B AVE
UST 13
UST 38
UST 87
AST 28
and 29
UST 32
UST 33
FAST 13
UST 24
UST 40
UST 37
FAST
15
FAST 14


WEST CENTER ROAD
ROAD J
ROAD I
ROAD H
ROAD G
ROAD F
H
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
AREA II
LARCH ROAD
E AVE
D AVE
C AVE
B AVE
A AVE
UST 35
UST 99
UST 36
UST 50
UST 49
UST 48
FAST 16
UST 47
UST 52
FAST 15
FAST 14
INTERSTATE 84

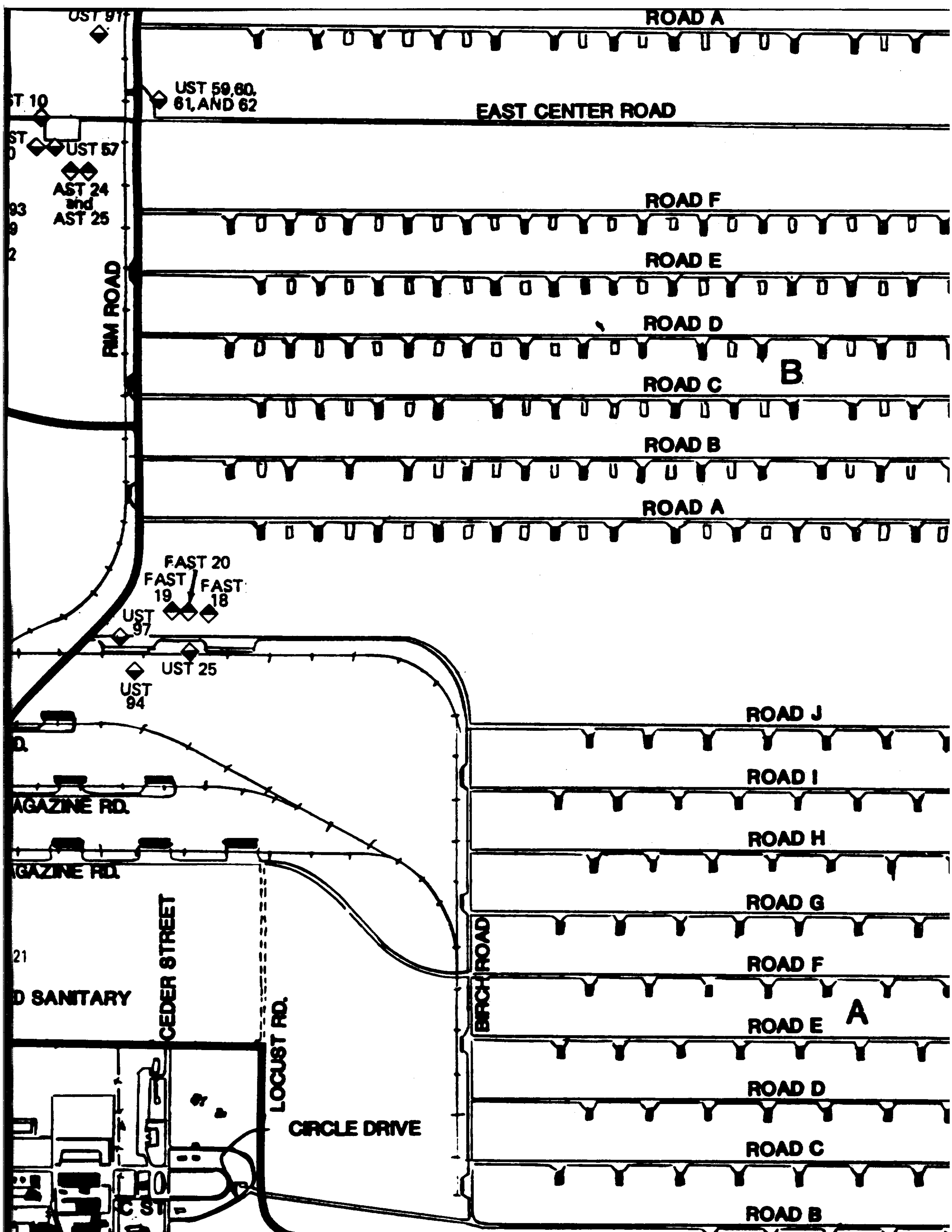


ROAD J
ROAD I
ROAD H
ROAD G
ROAD F
H
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
IRONWOOD ROAD
FAST 7
JUNIPER ROAD
FAST 6
FAST 5
CLASSIFICAT
UNION PACIFIC RA
NTERSTATE

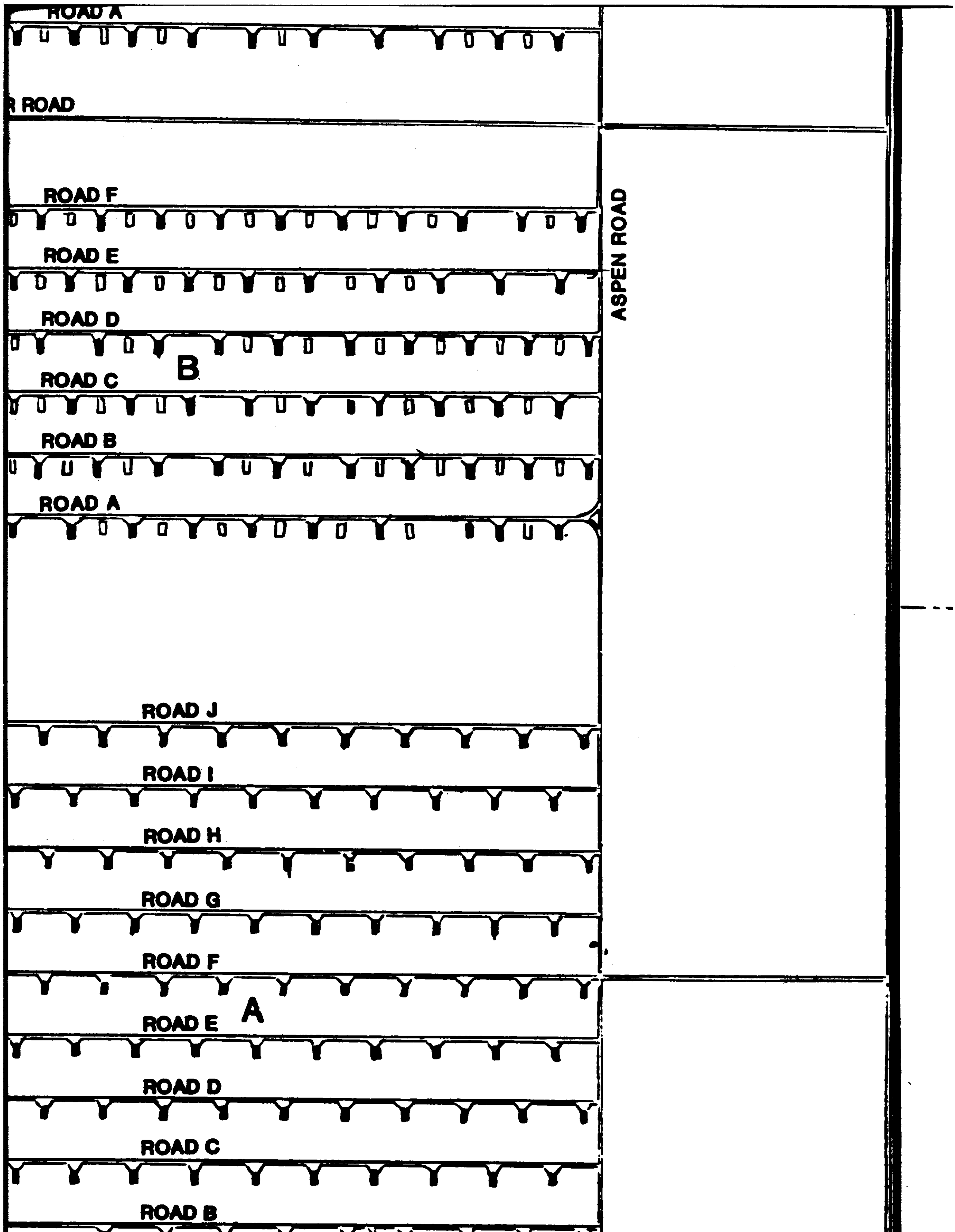

ROAD D
ROAD C
ROAD B
IRONWOOD ROAD
FAST 7
ROAD J
ROAD I
ROAD H
ROAD G
ROAD F
F
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
GREASEWOOD ROAD
JUNIPER ROAD
FAST 6
FAST 5
CLASSIFICATION YARD
IMHOFF TANKS

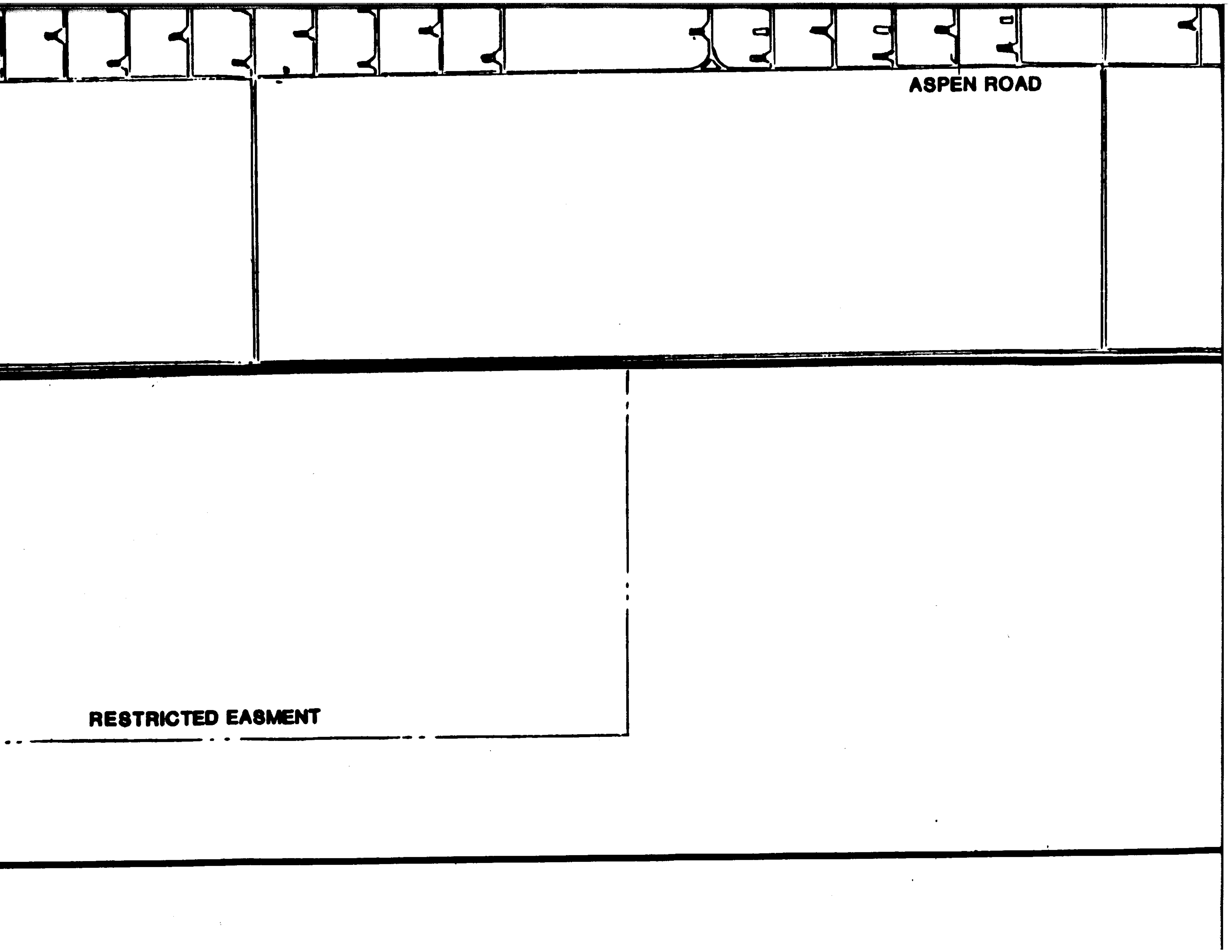


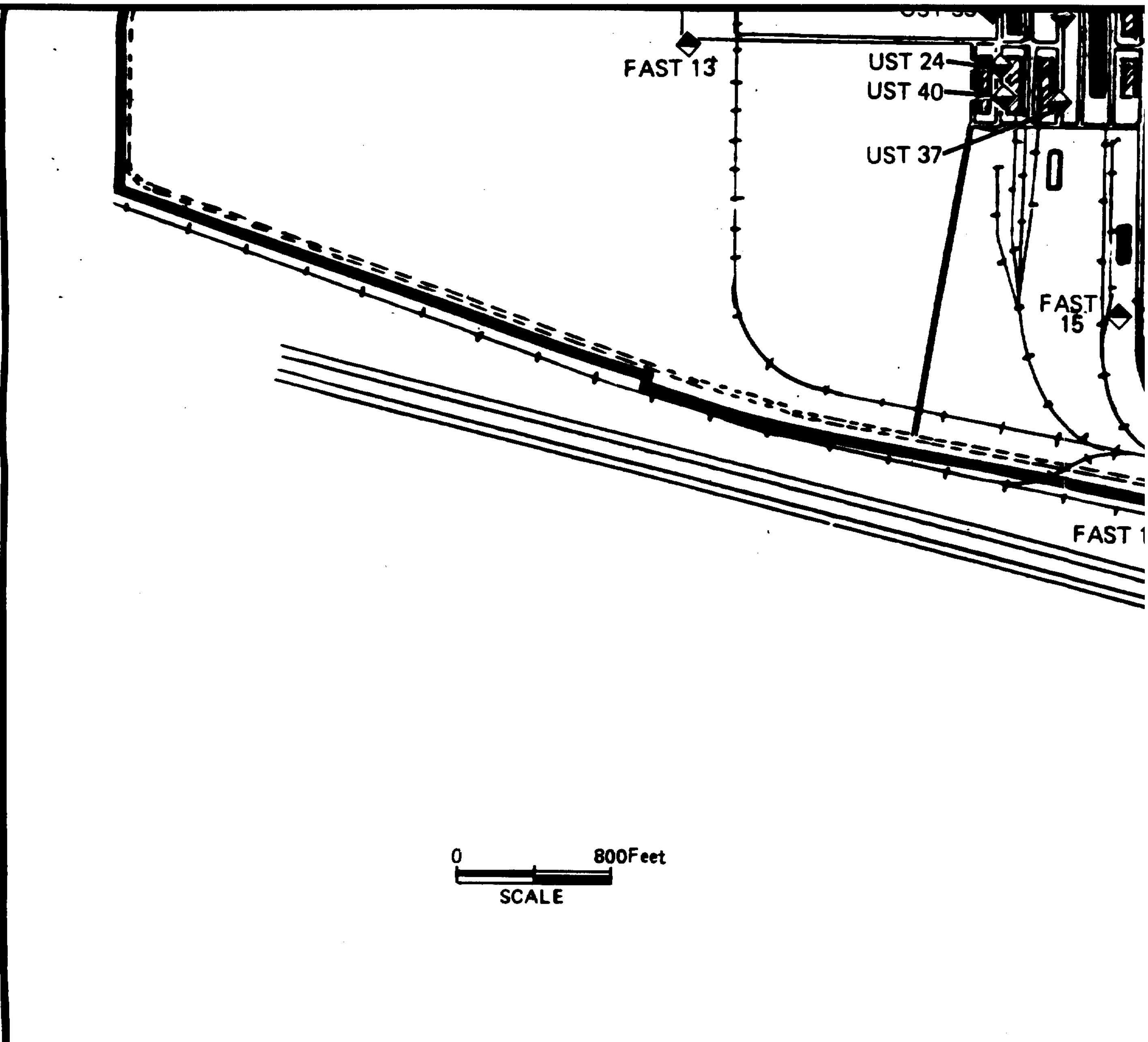
UST 10
UST 10
UST 57
AST 26
UST 98
AST 24 and AST 25
UST 93
UST 39
UST 92
RIM ROAD
COYOTE ROAD
UST 9
FAST 22
GREASEWOOD ROAD
AREA VI
F
FAST 19
UST 97
UST 94
N. MAGAZINE RD.
MAGAZINE RD.
S. MAGAZINE RD.
PALLET ROAD
FAST 21
ABANDONED SANITARY LANDFILL
CEDER STREET
D ST.
FIR ST
A ST
C ST
MHOFF TANKS



UST 91
ROAD A
UST 59,60, 61, AND 62
EAST CENTER ROAD
UST 57
AST 24 and AST 25
ROAD F
ROAD E
RIM ROAD
ROAD D
B
ROAD C
ROAD B
ROAD A
FAST 20
FAST 19
FAST 18
UST 97
UST 25
UST 94
ROAD J
ROAD I
AGAZINE RD.
ROAD H
AGAZINE RD.
ROAD G
CEDER STREET
21
D SANITARY
ROAD F
BIRCH ROAD
LOCUST RD.
A
ROAD E
ROAD D
CIRCLE DRIVE
ROAD C
C ST
ROAD B


ROAD A
R ROAD
ROAD F
ROAD E
ROAD D
B
ROAD C
ROAD B
ROAD A
ASPEN ROAD
ROAD J
ROAD I
ROAD H
ROAD G
ROAD F
A
ROAD E
ROAD D
ROAD C
ROAD B


ASPEN ROAD
RESTRICTED EASMENT



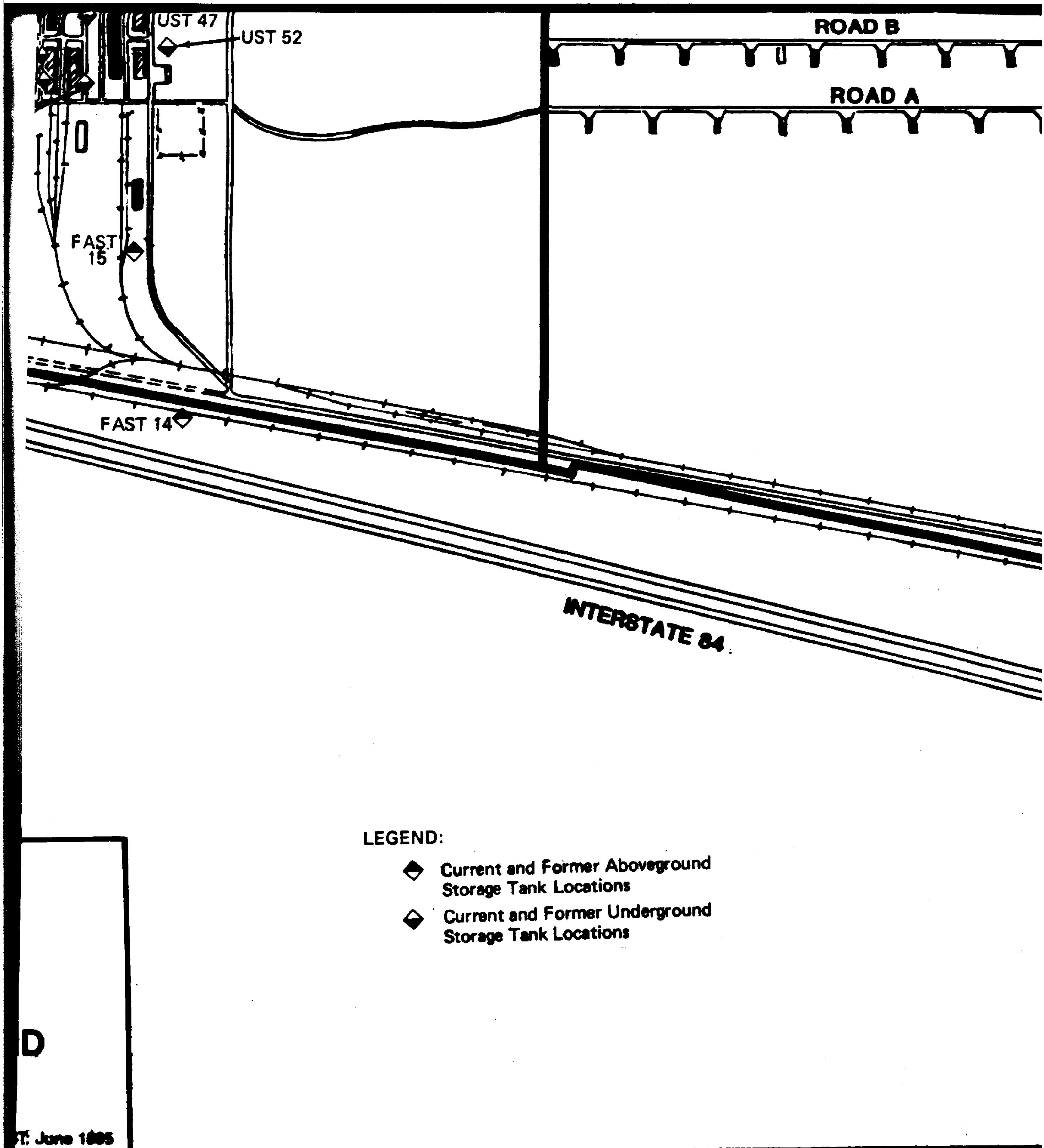
UMATILLA DEPOT ACTIVITY

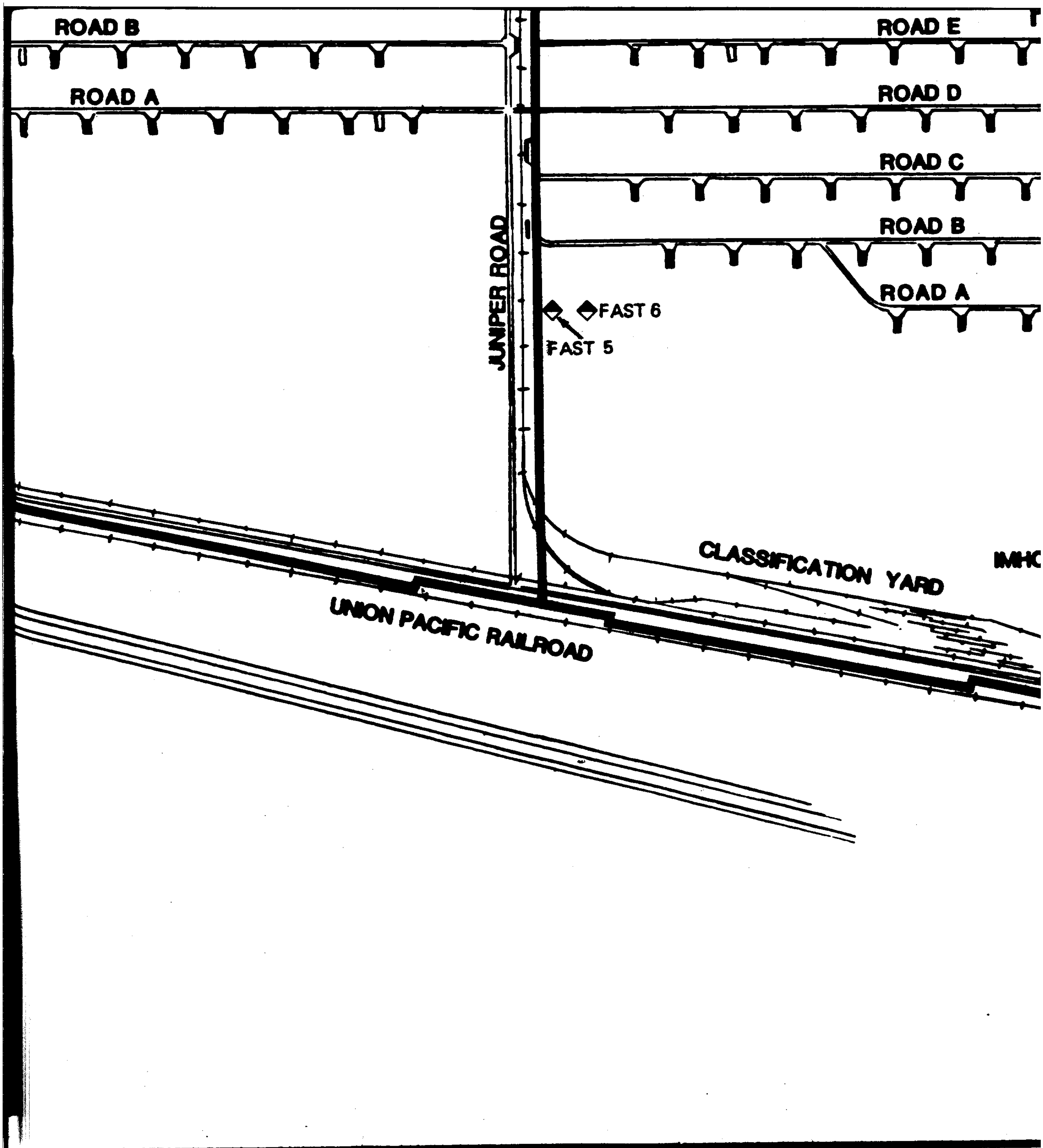
HERMISTON, OREGON

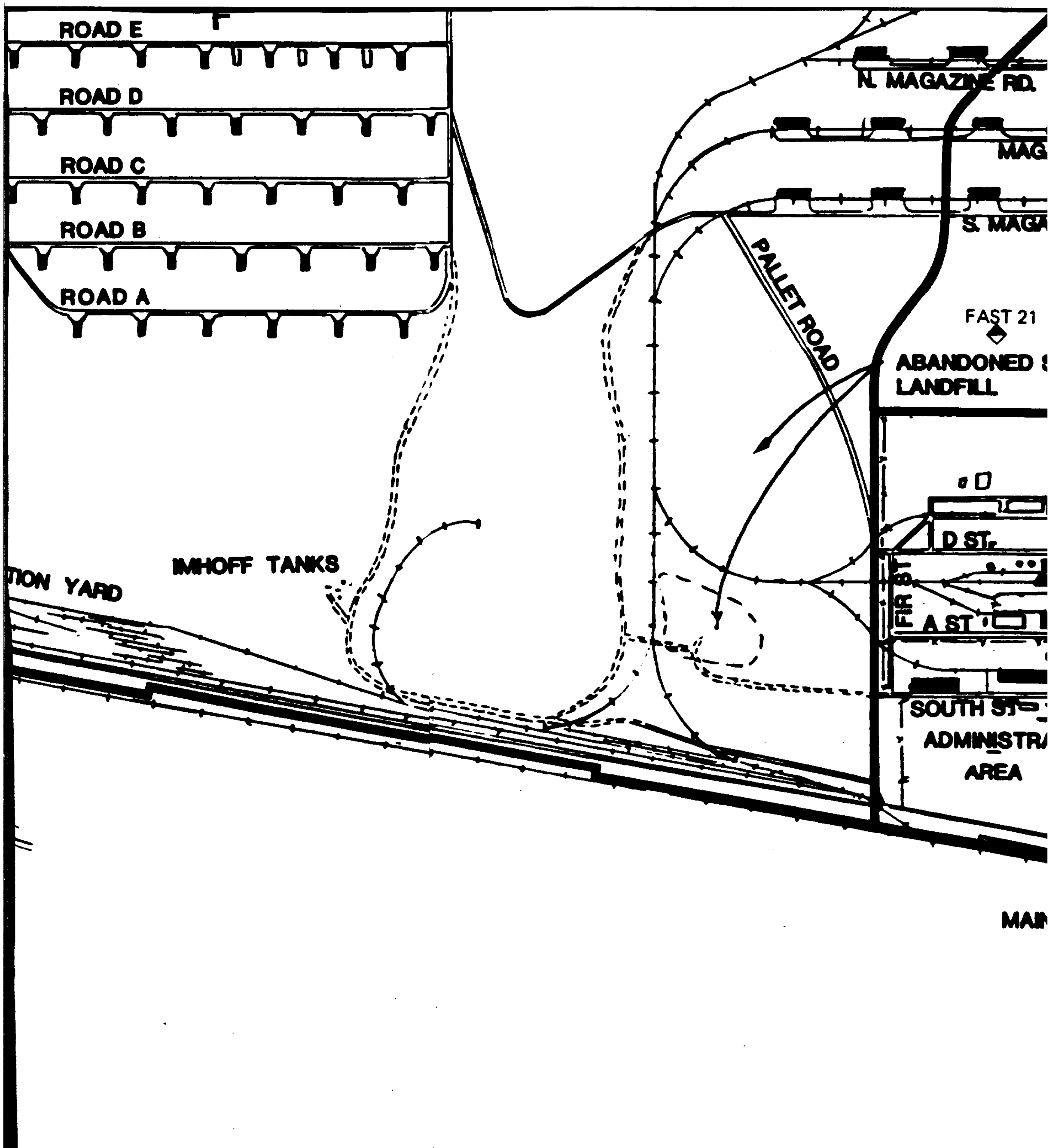
PLATE 2

EXISTING AND FORMER UNDERGROUND AND ABOVEGROUND STORAGE TANK LOCATION MAP

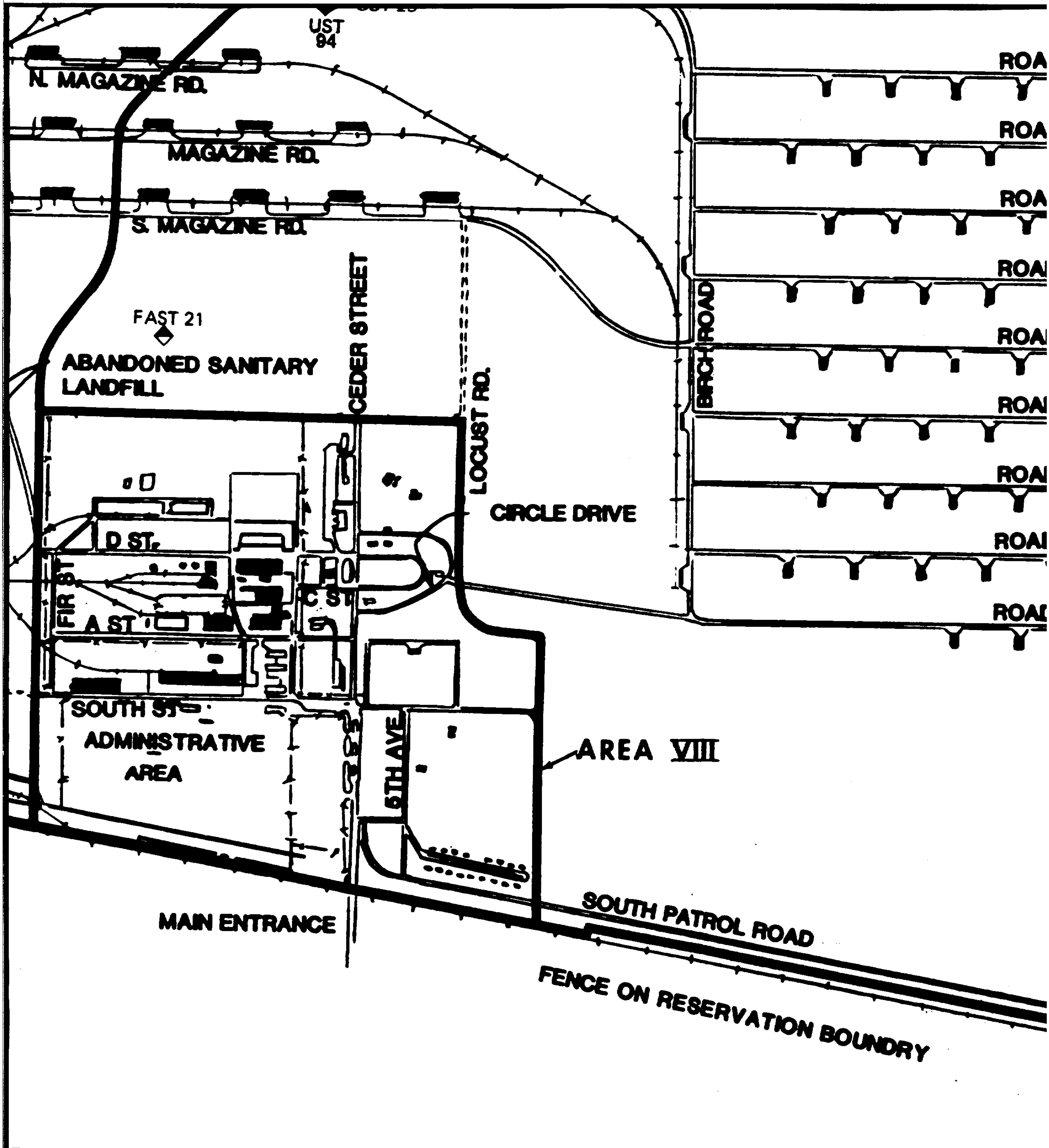
UST: June 1995


UST 47
UST 52
ROAD B
ROAD A
FAST 15
FAST 14
INTERSTATE 84
LEGEND:
Current and Former Aboveground Storage Tank Locations
Current and Former Underground Storage Tank Locations
D
T: June 1995

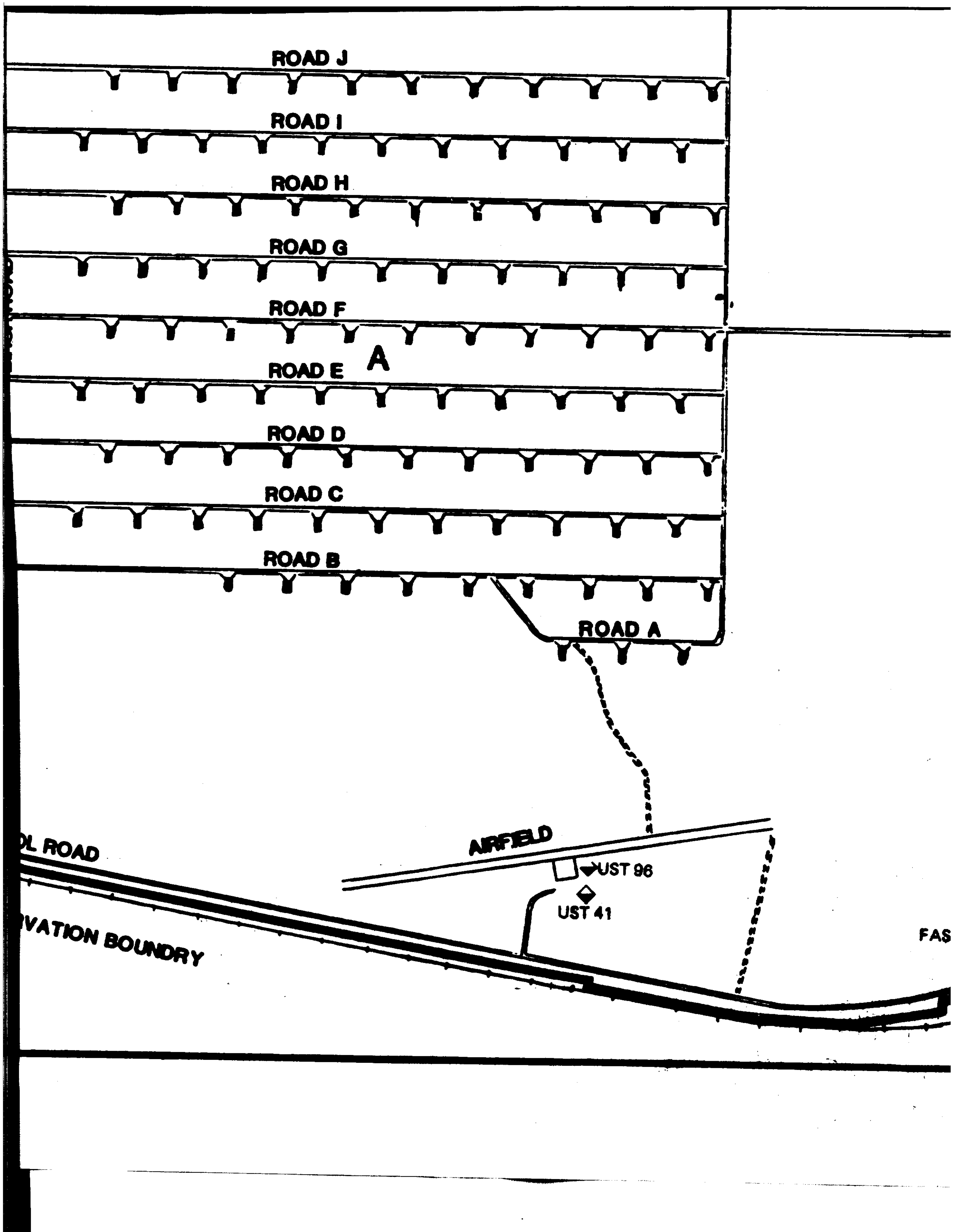

ROAD B
ROAD A
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
JUNIPER ROAD
FAST 6
FAST 5
CLASSIFICATION YARD
UNION PACIFIC RAILROAD



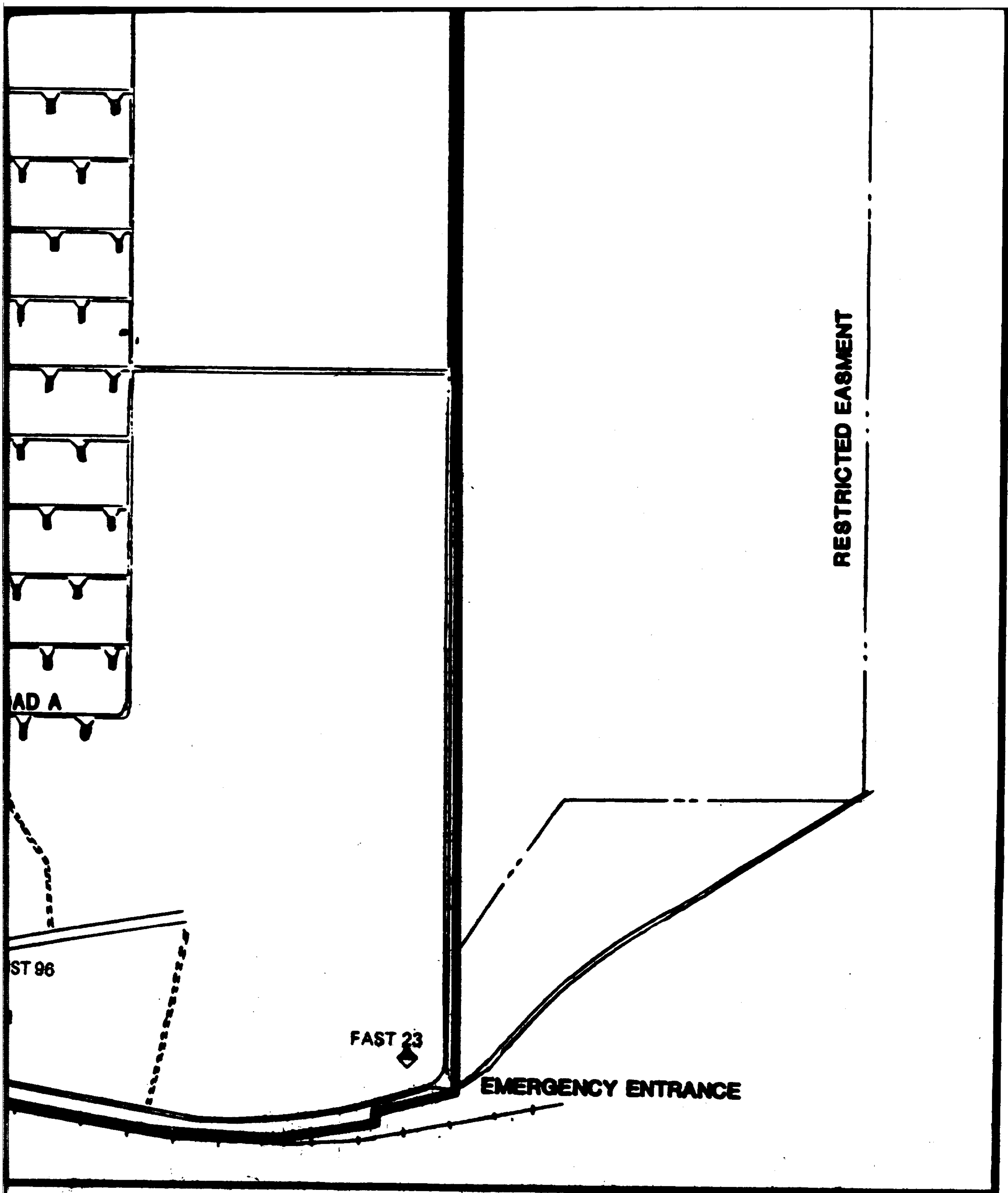
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
N. MAGAZINE RD.
S. MAGA
PALLET ROAD
FAST 21
ABANDONED S
LANDFILL
D ST.
FIR ST
A ST
IMHOFF TANKS
TION YARD
SOUTH ST
ADMINISTRA
AREA
MAIN



UST 94
N. MAGAZINE RD.
MAGAZINE RD.
S. MAGAZINE RD.
FAST 21
ABANDONED SANITARY LANDFILL
CEDER STREET
LOCUST RD.
BIRCH ROAD
CIRCLE DRIVE
D ST.
FIR ST
A ST
C ST
SOUTH ST
ADMINISTRATIVE AREA
6TH AVE
AREA VIII
MAIN ENTRANCE
SOUTH PATROL ROAD
FENCE ON RESERVATION BOUNDRY



ROAD J
ROAD I
ROAD H
ROAD G
ROAD F
A
ROAD E
ROAD D
ROAD C
ROAD B
ROAD A
AIRFIELD
UST 96
UST 41
OL ROAD
VATION BOUNDRY
FAS


RESTRICTED EASMENT
AD A
ST 96
FAST 23
EMERGENCY ENTRANCE